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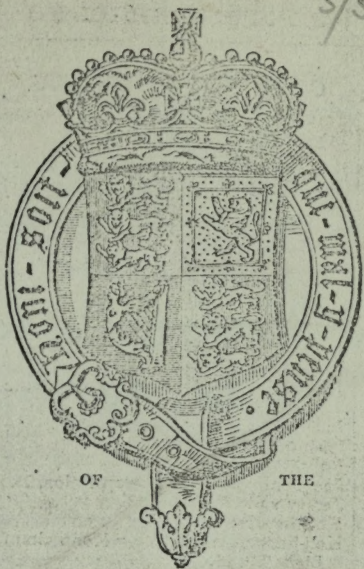
GUIDE

TO

GREAT

THE

EXHIBITION



OF THE

WORKS OF INDUSTRY OF ALL NATIONS.

1851.

THE EARTH IS THE LORD'S, AND ALL THAT THEREIN IS:
THE COMPASS OF THE WORLD AND THEY THAT DWELL THEREIN.

*Næ nostra, ista quæ invenimus, dixeris—
Insita sunt nobis omnium artium semina,
Magisterque ex occulto Deus producit ingenia.*

*Say not the discoveries we make are our own—
The germs of every art are implanted within us,
And God our instructor, from his concealment,
Develops the faculties of invention.*

*Humani generis progressus,
Ex communi omnium labore ortus,
Uniuscujusque industriæ debet esse finis:
Hoc adjuvando,
Dei opt: max: voluntatem exsequimur.*

*The progress of the human race,
Resulting from the common labour of all men,
Ought to be the final object of the exertion of each individual.
In promoting this end,
We are carrying out the will of the great and blessed God.*

WITH A PLAN OF THE BUILDING, RULES FOR VISITORS, AND SUGGESTIONS FOR THE GUIDANCE
OF LARGE PARTIES VISITING THE EXHIBITION.

LONDON:

SPICER BROTHERS, WHOLESALE STATIONERS; W. CLOWES AND SONS, PRINTERS;

Contractors to the Royal Commission,

29 NEW BRIDGE STREET, BLACKFRIARS, AND AT THE EXHIBITION, HYDE PARK,

AND SOLD BY ALL BOOKSELLERS.

PRICE TWOPENCE.

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A POPULAR GUIDE TO THE GREAT EXHIBITION, 1851.

INTRODUCTION.

RISE AND PROGRESS OF THE EXHIBITION.

A BRIEF notice upon the history of exhibitions of industrial products may be considered an appropriate commencement of this sheet.*

As early as the years 1756-7 the Society of Arts of London offered prizes for specimens of manufactures, tapestry, carpets, porcelain, &c., and exhibited the works which were offered in competition. About the same period the Royal Academy, as a private society, patronized by the Sovereign, more in a personal capacity than as representing the head of the Legislature, had organized its exhibitions of painting, sculpture, and engraving.

The first exhibition of industrial productions in France, recognised as a national institution, occurred in 1798; at that period the workshops were deserted, artisans were starving, and commercial enterprise scarcely existed. The originator of this idea, in the preceding year, was the Marquis d'Avèze.

In 1798, the Marquis d'Avèze's plans, which State troubles had before frustrated, were successfully carried out. And the more permanent and enduring benefits of such exhibitions having been recognised by the Government, the way was prepared for the first of those Expositions of National Industry, which, down to the present time, have supplied the manufactories of France with a stimulus the most effective and powerful.

These institutions were not continued annually, but with some interruptions, at varying intervals of three, four, thirteen, seven, and five years, the last being held in Paris in 1849. All these exhibitions were, however, from the first of a purely and strictly national description.

Local exhibitions on a small scale have been held in the metropolitan cities of the United Kingdom, and the most important manufacturing towns, at intervals during the last thirty years.

In 1829, an exhibition of works of art, science, and manufacture, originated with the Royal Dublin Society, and was commenced and carried on triennially, to which, however, Irish productions only were admitted until the year 1850. But the local exhibition of Birmingham, held in the autumn of the year 1849, may be said to have most nearly resembled the Exhibition of the present year.

The origin and development of the present Exhibition may be traced to the inquiry excited by the success of the French exposition in 1844, whether a similar exhibition might not be likely to confer similar benefit on the industry of the United Kingdom; and some efforts were made to obtain the assistance of the Government, but with no apparent results. Even in the year 1848, a proposal to

establish a self-supporting exhibition of British industry, to be controlled by a Royal Commission, was submitted to HIS ROYAL HIGHNESS THE PRINCE ALBERT, and by him laid before the Government.

The subject of a national exhibition, and the means of realizing it, became ultimately connected with the Society of Arts. In 1847, the Council of the Society established a limited exhibition of manufactures, professedly as the beginning of a series. The success of this exhibition determined the Council to persevere, and to hold similar exhibitions annually. Accordingly, in the next year the experiment was repeated with such greatly increased success, that the Council felt warranted in announcing their intention of holding annual exhibitions, as a means of establishing a quinquennial Exhibition of British Industry, to be held in 1851. In the year 1849, the exhibition, still more successful than any preceding one, consisted chiefly of works in the precious metals, some of which were graciously contributed by HER MAJESTY.

Immediately after the termination of the session of 1849, HIS ROYAL HIGHNESS THE PRINCE ALBERT, as President of the Society, took the subject under his own personal superintendence. In order to carry out the objects of the Exhibition, a Royal Commission was ultimately formed, and the necessary funds for the undertaking were collected by contributions. Relying on the national sympathies and support, no attempt has been made to obtain Government assistance.

The tender, by Messrs. Fox, Henderson, and Co., for the construction of the building, upon the designs submitted by Mr. Paxton, was not accepted by the Royal Commissioners until the 26th of July, 1850: the designs had to be modified and working drawings made: possession of the site was only obtained on the 30th of July, and the first column was not fixed until the 26th of September.

On the ground being given up to the contractors, the first work undertaken was the construction of a hoarding to enclose the whole area of the site. This hoarding was formed by the insertion into the ground, in pairs, of the timbers ultimately to be used as joists. Between each pair of uprights were slipped the ends of boards, to be subsequently used as floor-boards; and these were secured by attaching together the two ends of the joists extending above them. Thus the expense of the hire of waste boarding was avoided; the timber composing the hoarding was completely uninjured; and the celerity with which the whole area was surrounded was remarkable.*

The setting out of the building was then proceeded

* The most important of these facts are derived from the Official account written by Mr. H. Cole, for the "Illustrated Catalogue."

* The source of these facts is the Official account written by Mr. M. Digby Wyatt.

with, stakes having been driven into the ground to indicate approximately the position of the columns, their precise centres were ascertained by the use of the theodolite, and marked by driving a nail into each stake at the exact point. When it became necessary to remove these stakes, in order to dig out holes for the concrete foundations, an ingenious method was resorted to, for identifying at any time the position occupied by the nail which had been removed. The height of the surface of the mortar, varying with almost every column, was regulated by pegs driven to the correct level.

As every casting was delivered on the ground, it underwent a careful examination, and was immediately painted. The girders, upon the perfect soundness of which the stability of the galleries and roof mainly depended, were subjected to a rigorous test, in a machine arranged for the purpose. One of Mr. HENDERSON'S patent cranes was so placed, that, on a waggon containing girders being brought beneath its range, a girder was lifted from the waggon and deposited upon a weighing apparatus. An account having been taken of its weight, the girder was again lifted by the crane, and carried forward to an extremely strong frame, the two ends of which corresponded in form and dimensions to the connecting-pieces with their projections. The girder being securely confined in these clutches, a force was exerted upon it at the two points upon which the weight of the floors and roofing would have to be carried, that is to say, immediately over its vertical lines. The force thus communicated was applied by two pistons, forced upwards by a modification of the hydraulic press. A registering apparatus affixed to the pipe leading from the force-pump to the testing-machine, afforded the means of adjusting the pressure exercised by the hydraulic press. A careful observation of this apparatus conveyed the assurance, that every girder, according to its ultimate destination, was proved to a strain of either 9, 15, or 22 tons. After testing, the girder was released from its confinement, again raised by the crane, and stacked in a convenient place ready for removal. So admirably were the various arrangements made for conducting these operations, that it was possible for a girder to be lifted from its waggon, weighed, secured in the testing-machine, proved, released, again raised, and finally deposited in less than four minutes.

In order to elevate the columns to their places, what is known in technical language as a pair of shear-legs, was employed. This simple apparatus consists of two poles lashed together at their heads, and maintained in a steady position by ropes extending from the apex of the triangle formed by the base-line of the ground, and the inclination of the poles, to one another, to stakes driven into the ground at a considerable distance. From the apex of the triangle a series of ropes passing over pulleys were suspended perpendicularly; and, by means of this "fall," the majority of the columns, girders, and other heavy portions of the construction, were elevated to their places. Modifications of the simple apparatus described sufficed to hoist almost every part of the necessary iron-work. A connecting-piece was attached to each column previous to its elevation; and so soon as two columns with their connecting pieces were fixed, a girder was run up, slipped between the projections of the connecting pieces, and secured in its place. An opposite pair of columns

having been similarly elevated, another girder was attached to them; and thus two sides of a square were formed, and maintained in a vertical position by poles acting as supports to them. Two other girders being then hoisted, and slipped between the connecting pieces on the remaining two sides of the squares, a perfect table was constructed. The "shores" or supports were then removed, together with the shear-legs, and the whole apparatus was at liberty, for the purpose of recommencing a similar operation in an adjoining 24-feet bay.

When a sufficient number of these bays had been completed (starting from the intersection of the Nave and Transept) to warrant the addition, the hoisting of the columns for the first floor was commenced; more lofty shear-legs being of course employed. The extension of the ground-floor structure proceeding, as that of the first-floor was carried on, a base was in turn afforded for the columns of the third tier; and thus the iron framework of the whole building rose from the ground, firm and secure, without involving the necessity of any scaffolding whatever.

While these operations of actual structure were being carried on, the work of preparation was yet more vigorously pushed. The Paxton gutters and sash-bars, prepared by ingenious machinery, were got ready by mile lengths. The latter were even painted by mechanical assistance.

While the various machines were busily operating in the preparation of the necessary framework to receive the glass, the makers of the glass were not less actively employed. The large size of the sheets required (4 feet 1 inch by 10 inches), and the short time within which the immense quantity necessary had to be supplied, demanded the employment of numerous additional hands, and workmen had to be sought for from abroad to assist in the completion of the order within the requisite time. The mode of manufacturing the description of glass employed is a great improvement on the old system of crown-glass making; as by it the variation of the substance occasioned by the thickness of the glass, as it approaches the bull's-eye, is completely avoided. In the manufacture of sheet glass, the workman, having taken up a lump of glass on the end of his pipe, alternately blows, swings his ball of glass to and fro, and rolls it upon a metal table until it assumes the form of a long cylinder; the ends being then taken off, and the cylinder cut in the direction of its length, the sheet of glass falls down, is flattened to a perfectly true face, and is then trimmed off and finished.

During the preparation of the materials necessary to commence the construction of the Paxton roofing, active progress had been made in the framing of the wrought-iron trusses requisite to span the central 72-feet nave, and the 48-feet avenues on each side of it. A steam-engine of 6-horse power gave motion to drilling, punching, and cutting-machines. By means of these, the necessary pieces of bar-iron were adjusted to their requisite lengths.

While these active preparations for the construction of the roofing were in progress, the daily supplies of castings of every description were of the most abundant nature; no less than 316 girders having been cast and supplied in one week. As fast as the columns came upon the ground, they were taken to their places and immediately fixed. Up to the 20th of September, 77 columns had been supplied.

By the week ending the 25th of October, the average number fixed per week amounted to nearly 200, and that rate of supply was continued for several subsequent weeks.

The attention of the contractors was next directed to the formation of the transept ribs. The choicest timber was selected for that purpose: their form was set out upon a platform erected for the purpose, and the timbers for the first rib laid down. When the rib thus commenced was completed, it was made to serve as a template for the construction of a second; and thus one was fitted upon the others, until the pile had accumulated to four. Three of these having been then laid down in other places, the remainder were constructed upon them in a similar manner.

As supplies of the smaller castings necessary to complete the various portions of the structure poured in, the work of erection and putting together proceeded with wonderful rapidity. The progressive increase in the number of hands employed affords a tolerable indication of the increasing intensity of the work:—

1850.	In the week ending Sept. 6,	39 men employed.
	Oct. 4,	419 "
	Nov. 1,	1,476 "
	Dec. 6,	2,260 "
1851.	Jan. 3,	2,112 "

and from that time, until within a month of the opening of the Exhibition, the average number has rarely fallen below 2,000.

Towards the beginning of December, the climax of activity was arrived at, and the most trying operation in the whole construction of the building commenced, namely, the hoisting of the main ribs for the great transept-roof.

The raising of the main ribs commenced on the 4th of December, and the whole sixteen were fixed in one week. It occupied about an hour to raise a pair of ribs from the ground to the level of the lead flat, but the previous preparations involved a much longer space of time. Eleven men worked at each crab, and about 16 were employed on the lead flat, to guide the ribs in their ascent, and see to the safe condition of the shear-legs and tackle. Considering the anxious nature of this performance, it must be regarded as a most gratifying circumstance, that the whole operation was accomplished without any untoward occurrence.

No sooner had the skeleton of the transept-roof been completed than the work of glazing the whole roof commenced. And in this, ingenious machines were employed; one variety of these was capable of accommodating two glaziers; these machines consisted of a stage of deal, about 8 feet square, with an opening in its centre sufficiently large to admit of boxes of glass, and supplies of sash-bars, putty, &c., being hoisted through it. The stage rested on four small wheels, travelling in the Paxton gutters.

The dexterity acquired by the men in working the machines was very remarkable. By means of them, 80 men in one week, put in upwards of 18,000 panes of glass, being not less than 62,600 feet superficial. The greatest number of panes inserted by a man in one day was 108, being 367 feet 6 inches of glazing.

Among the later operations connected with the completion of the work, the most remarkable for the celerity with which it was conducted, was the ornamental painting

of the nave roof. Iron straps, attached to the trusses, supported a number of scaffold poles, on which a perfect cloud of boards was laid, and as many as between 400 and 500 painters, by these means, worked their way, with extreme rapidity, from one end of the building to the other.

By the 1st of May the building was completed; the interior and a great part of the exterior were painted; the roof covered with canvas, and the crowds of workmen of all kinds, exhibitors, and their assistants, were replaced by the vast assembly collected to witness the inauguration of the Exhibition by Her Majesty, which took place punctually on that day, as determined sixteen months before. On that memorable occasion the following Report was read by His Royal Highness Prince Albert:

MAY IT PLEASE YOUR MAJESTY,

WE, the Commissioners appointed by Your Majesty's Royal Warrant of the 3rd of January, 1850, for the promotion of the Exhibition of the Works of Industry of all Nations, and subsequently incorporated by Your Majesty's Royal Charter of the 15th of August in the same year, humbly beg leave, on the occasion of Your Majesty's auspicious visit at the opening of the Exhibition, to lay before you a brief statement of our proceedings to the present time.

By virtue of the authority graciously committed to us by Your Majesty, we have made diligent inquiry into the matters which Your Majesty was pleased to refer to us, namely, into the best mode of introducing the productions of Your Majesty's Colonies and of Foreign Countries into this Kingdom, the selection of the most suitable site for the Exhibition, the general conduct of the undertaking, and the proper method of determining the nature of the prizes, and of securing the most impartial distribution of them.

In the prosecution of these inquiries, and in the discharge of the duties assigned to us by Your Majesty's Royal Charter of Incorporation, we have held constant meetings of our whole body, and have, moreover, referred numerous questions connected with a great variety of subjects to Committees, composed partly of our own members and partly of individuals distinguished in the several departments of science and the arts, who have cordially responded to our applications for their assistance at a great sacrifice of their valuable time.

Among the earliest questions brought before us was the important one as to the terms upon which articles offered for exhibition should be admitted into the Building. We considered that it was a main characteristic of the national undertaking in which we were engaged that it should depend wholly upon the voluntary contributions of the people of this country for its success; and we therefore decided, without hesitation, that no charge whatever should be made on the admission of such goods. We considered, also, that the office of selecting the articles to be sent should be intrusted in the first instance to Local Committees, to be established in every foreign country, and in various districts of Your Majesty's dominions, a general power of control being reserved to the Commission.

We have now the gratification of stating that our anticipations of support in this course have in all respects been fully realized. Your Majesty's most gracious donation to the funds of the Exhibition was the signal for voluntary

contributions from all, even the humblest classes of your subjects, and the funds which have thus been placed at our disposal amount at present to about 65,000*l*. Local committees, from which we have uniformly received the most zealous co-operation, were formed in all parts of the United Kingdom, in many of Your Majesty's colonies, and in the territories of the Hon. East India Company. The most energetic reports have also been received from the Governments of nearly all the countries of the world, in most of which Commissions have been appointed for the special purpose of promoting the objects of an exhibition justly characterised in Your Majesty's Royal Warrant, as an Exhibition of the Works of Industry of all Nations.

We have also to acknowledge the great readiness with which persons of all classes have come forward as exhibitors. And here, again, it becomes our duty to return our humble thanks to Your Majesty for the most gracious manner in which Your Majesty has condescended to associate yourself with your subjects, by yourself contributing some most valuable and interesting articles to the Exhibition.

The number of exhibitors whose productions it has been found possible to accommodate, is about 15,000, of whom nearly one-half are British. The remainder represent the productions of more than forty foreign countries, comprising almost the whole of the civilized nations of the globe. In arranging the space to be allotted to each, we have taken into consideration both the nature of its productions and the facilities of access to this country afforded by its geographical position. Your Majesty will find the production of Your Majesty's dominions arranged in the western portion of the Building, and those of foreign countries in the eastern. The Exhibition is divided into four great classes of—1. Raw Materials; 2. Machinery; 3. Manufactures; and 4. Sculpture and the Fine Arts. A further division has been made according to the geographical position of the countries represented; those which lie within the warmer latitudes being placed near the centre of the Building, and the colder countries at the extremities.

Your Majesty having been graciously pleased to grant a site in this your Royal park for the purposes of the Exhibition, the first column of the structure now honoured by Your Majesty's presence was fixed on the 26th of September last. Within the short period, therefore, of seven months, owing to the energy of the contractors, and the active industry of the workmen employed by them, a building has been erected, entirely novel in its construction, covering a space of more than eighteen acres, measuring 1,851 feet in length, and 456 feet in extreme breadth, capable of containing 40,000 visitors, and affording a frontage for the exhibition of goods to the extent of more than 10 miles. For the original suggestion of the principle of this structure, the Commissioners are indebted to Mr. Joseph Paxton, to whom they feel their acknowledgments to be justly due, for this interesting feature of their undertaking.

With regard to the distribution of Rewards to deserving Exhibitors, we have decided that they shall be given in the form of Medals, not with reference to merely individual competition, but as rewards for excellence in whatever shape it may present itself. The selection of the persons to be so rewarded has been intrusted to Juries equally composed of British subjects and of Foreigners, the former having been selected by the Commission from

the recommendations made by the Local Committees, and the latter by the Governments of the Foreign Nations, the productions of which are exhibited. The names of these Jurors, comprising as they do many of European celebrity, afford the best guarantees of the impartiality with which the Rewards will be assigned.

It affords much gratification that, notwithstanding the magnitude of this undertaking, and the great distances from which many of the articles now exhibited have had to be collected, the day on which Your Majesty has been graciously pleased to be present at the inauguration of the Exhibition, is the same day that was originally named for its opening, thus affording a proof of what may, under God's blessing, be accomplished by goodwill and cordial co-operation among nations, aided by the means that modern science has placed at our command.

Having thus briefly laid before Your Majesty the results of our labours, it now only remains for us to convey to Your Majesty our dutiful and loyal acknowledgments of the support and encouragement which we have derived throughout this extensive and laborious task, from the gracious favour and countenance of Your Majesty. It is our heartfelt prayer that this undertaking, which has for its end the promotion of all branches of human industry and the strengthening of the bonds of peace and friendship among all nations of the earth, may, by the blessing of Divine Providence, conduce to the welfare of Your Majesty's people, and be long remembered among the brightest circumstances of Your Majesty's peaceful and happy reign.

HER MAJESTY'S REPLY.

I RECEIVE with the greatest satisfaction, the Address which you have presented to me on the opening of this Exhibition.

I have observed with a warm and increasing interest, the progress of your proceedings in the execution of the duties intrusted to you by the Royal Commission, and it affords me sincere gratification to witness the successful result of your judicious and unremitting exertions in the splendid spectacle by which I am this day surrounded.

I cordially concur with you in the prayer, that by God's blessing this undertaking may conduce to the welfare of my people and to the common interests of the human race, by encouraging the arts of peace and industry, strengthening the bonds of union among the nations of the earth, and promoting a friendly and honourable rivalry in the useful exercise of those faculties which have been conferred by a beneficent Providence for the good and the happiness of mankind.

HIS GRACE THE ARCHBISHOP OF CANTERBURY then offered up the following prayer, invoking God's blessing upon the undertaking:—

ALMIGHTY and everlasting God, who dost govern all things both in Heaven and in earth, without whom nothing is strong, nothing is holy, accept, we beseech Thee, the sacrifice of praise and thanksgiving, and receive these our prayers, which we offer up unto Thee this day, on behalf of the kingdom and people of this land. We acknowledge, O Lord, that thou hast multiplied on us blessings which Thou mightest most justly have withheld. We acknowledge that it is not because of works of righteousness which we have done, but of Thy great

mercy, that we are permitted to come before Thee with the voice of thanksgiving, and that instead of humbling us for our offences, Thou hast given us cause to thank Thee for Thine abundant goodness. And now, O Lord, we beseech Thee to bless thy work which Thou hast enabled us to begin, and to regard with Thy favour our purpose of knitting together in the bonds of peace and concord the different nations of the earth; for with Thee, O Lord, is the preparation of the heart in man. Of Thee it cometh that violence is not heard in our land, wasting nor destruction within its borders. It is of Thee, O Lord, that nations do not lift up the sword against each other, nor learn war any more; it is of Thee that peace is within our walls, and plenteousness within our palaces; it is of Thee that knowledge is increased throughout the world, for the spirit of man is from Thee, and the inspiration of the Almighty giveth him understanding. Therefore, O Lord, not unto us, not unto us, but unto Thy name be all the praise. While we survey the works of art and industry which surround us, let not our hearts be lifted up that we forget the Lord our God, as if our own power and the might of our hands had gotten in this wealth. Teach us ever to remember that all this store which we have prepared cometh of Thine hand and is all Thine own. Both riches and honour come of Thee, and thou reignest over all. In thine hand it is to make great and to give strength unto all. Now, therefore, O God, we thank Thee; we praise Thee, and entreat Thee so to overrule this assembly of many nations, that it may tend to the advancement of Thy glory, to the diffusion of Thy holy word, to the increase of general prosperity, by promoting peace and goodwill among the different races of mankind. Let the many mercies which we receive from Thee dispose our hearts to serve Thee more faithfully, who art the author and giver of them all. And, finally, O Lord, teach us so to use those earthly blessings which Thou givest us richly to enjoy, that they may not withdraw our affections from those heavenly things which Thou hast prepared for those that love and serve Thee, through the merits and mediation of thy Son Jesus Christ our Lord, to whom, with Thee and the Holy Ghost, be all honour and glory.

HER MAJESTY then proceeded along the building in Royal Procession, and on returning to the platform, declared the *Exhibition opened*.

The mottoes introduced on the title-page of this work were selected by His Royal Highness Prince Albert for insertion in the title-pages of the Catalogues.

The results of this great undertaking belong to the future rather than to the present. The opportunity is now offered for improvement—time alone can develop its consequences. The occasion demands the thoughts of every individual of every class; for its attendant circumstances and ultimate effects must be experienced directly or indirectly by every member of the community. The Exhibition can no longer be regarded as a private undertaking; it has become incorporated into the history of our age and nation. May it be the effort of every one who wishes well to his country to use this opportunity in the right manner, and for the promotion of the best ends. A time has come when much may be done for good. The nations of the earth are scarcely separated by distance or time. And on this occasion many will be availing themselves of the facilities of transit in order to enjoy the opportunities of instruction and improvement afforded by this Great Exhibition. Be it the emulation of our countrymen to use this occasion as one fraught with momentous interests. The privileges enjoyed by our country in the free circulation of the Holy Scriptures; the proclamation of the gospel; the solidity of the constitution, and the civil and religious liberty of the subject, will be open to the practical observation of many nations. The due fruit of these inestimable advantages should be also apparent; and as God has been honoured by the public acknowledgment on the great occasion alluded to, that from Him alone proceeds all that we have received and prepared, so may He be also honoured in the result. Be it the part of History to record that the Great Exhibition was the means, under Divine Providence, of realizing the hope expressed by the PRINCE, that "the first impression which the view of this vast collection will produce will be that of deep thankfulness to the Almighty for the blessings which he has bestowed upon us already here below; and the second, the conviction that these can be only realized in proportion to the help which we are prepared to render to each other—therefore, only by peace, love, and ready assistance, not only between individuals, but between the nations of the earth."

GUIDE TO THE EXHIBITION.

It is of great importance to observe a regular plan of inspecting the contents of the Exhibition. See Art. 4 of the Official Rules on the last page. A few directions have been also prepared by a gentleman versed in such arrangements, for the information of large parties entering the Exhibition, and are given at page 31.

This Guide is arranged into the following parts:—

1. GROUND FLOOR, EAST.—FOREIGN COUNTRIES. These are placed on the South side or left hand, *entering* at the East Entrance: and also on the North side, or the left, *going back* towards the East.

2. GALLERIES, EAST.—FOREIGN. In the North Gallery the objects are from West to East; in the South Gallery, from East to West.

3. GROUND FLOOR, WEST.—BRITISH AND COLONIAL. South side, the objects are described in successive order, East to West; North side, West to East.

4. GALLERIES, WEST.—BRITISH. North Gallery, West to East; South Gallery, East to West.

The Main Avenues or Nave, and the Transept (where the trees, &c. are), are described separately.

FOREIGN COUNTRIES.

Ground Floor, East.—Main Avenue, going West.

Large bell of Union metal.
 Statue: The Wounded Indian.
 India-rubber boats.
 Railway bridge of simple construction, United States.
 Statue in marble; The Greek Slave.
 Mass of zinc ore (red oxide), weighing 16,400 lbs., taken from near the surface in Sussex county, New Jersey.
 Model of the Falls of Niagara.
 Orestes, a statue.
 Adam and Eve, in plaster.
 Four tables of inlaid marble, and pedestal with eagle.
 A bell of brass, 843 lbs. weight, with iron clapper and tackle.
 Models of two groups, representing the breaking-in of horses.
 A fountain, with group of children, &c.
 Girl at Well, in bronze.
 Statue: Armining, Prince of the Cheruskers, a hostage at Rome.
 Newfoundland Dog in bronze, after the model of Moeller.
 Cast of a part of the pedestal of the monument of Frederic William III. of Prussia.
 The Muse Polyhymnia, after the antique statue in the Royal Museum, Berlin.
 A Faun carrying a Vine Branch.
 Gothic vase in terra-cotta.
 Colossal Lion, fifteen feet long, and fifteen feet high.
 Marble pedestal; table-tops of marble and red-granite; large vase with pedestal.
 Two statues, seven feet high, cast in bronze and unchased: Libussa, Queen of the Bohemians, A.D. 700; and George I. of Bohemia.
 Boy with a Swan, in bronze, the property of the King of Prussia.
 Group of figures in cast-iron; the Warwick vase; the Athenian vase; the Alexander vase, the border decorated with reliefs after Thorwaldsen, from the Royal Prussian Iron foundry, Berlin.
 Large terrestrial globe, showing elevation of mountains above sea-level.
 Group, in zinc, bronzed, representing an Amazon on horseback attacked by a tiger—from the original model by Prof. A. Kiss, of Berlin; cast in zinc and bronzed.
 Coil of flat iron-wire rope, made by Felten of Cologne.
 Castings in zinc.
 Four statuettes from the Niebelungen, by Ferneoni, cast in iron; candelabrum; and statue in bronze, Field-Marshal Radetzky, from the Prince of Salms' Foundry, Vienna.
 Painted window, representing Dante and some of his Ideas.
 The Wounded Achilles, and two statues in marble.
 Group in marble: The Anglers.
 Group in marble: Mazeppa.
 Castings in zinc: Stag at Rest.
 Statue: The Torments of Cain.

Statues: Psyche, Cupid, &c.
 Statuette: A Child.
 A plaster group: The Lion in Love; and a small marble statue of Cupid.
 Equestrian statue of Godfrey of Bouillon. The Happy Child, and the Unhappy Child.
 Two large bronze vases.
 Group in bronze: The Death of the Stag.
 Group in plaster.
 Statue: The Dancing Faun.
 Bust in marble: "Fiat Voluntas Tua."
 Bronze bust of a Moor.
 St. Michael and the Dragon, colossal group in plaster.
 Statue: Boy playing at Marbles.
 Large iron tazza.
 Bas-relief in bronze: The Raft.
 Bas-reliefs in marble, The Medici, and Francesca da Rimini.
 Group in plaster.
 Church organ.
 Iron fountain.
 Statue of Her Majesty the Queen, cast in zinc by the Vieille Montagne Mining Company.
 Statues of Flora and Venus, by the late Richard Wyatt, of Rome.
 Large tazza of Oriental alabaster, of the diameter of 3½ English feet.
 Large earthen olive jar, from Portugal.
 A long howitzer, from Royal Cannon Foundry, Seville.
 Howitzer and Mortar of wrought-iron, from the Royal Ordnance Office, Onate, Spain.
 Large earthen wine jar, manufactured in the village of Toboso, in La Mancha.
 Mass of native silver from the province of Atacama, in Chili, weight 154 lbs. 5 oz. English.
 Large quartz crystal. Exhibited by the Duke of Devonshire.
 Model of a colossal statue of the late Marquis of Bute.
 Statue of Dr. Goodhall, provost of Eton (at South).
 Model for a statue of Dr. Jenner (at North).
 Zephyr and Aurora (at South).
 Shield presented by His Majesty the King of Prussia to His Royal Highness the Prince of Wales, in commemoration of the baptism of the infant Prince, for whom His Majesty acted as sponsor. Exhibited by His Royal Highness Prince Albert, on behalf of His Royal Highness the Prince of Wales.
 The great diamond of Runjeet Singh, "Koh-i-noor," valued at 2,000,000l. sterling. Exhibited by Her Majesty the Queen.
 Andromeda, in bronze, by J. Bell.
 Portrait of Her Majesty on Sèvres china, size of life, half length, by A. Ducluzeau, after a portrait by F. Winterhalter.
 Portrait of H.R.H. Prince Albert, on Sèvres china, size of life, half length, painted by A. Bezanget, after a portrait by F. Winterhalter. These portraits are exhibited jointly by Her Majesty and H.R.H. Prince Albert.

South Side, going West.

UNITED STATES.

A very large space is occupied by this country, which is not by any means filled. The articles on this side the Nave comprise a fine collection of those beautiful sun-drawn pictures in which the Americans particularly excel. Some of these are on glass; the majority are daguerreotypes.

Some of the cabinet furniture in this section is also interesting, and a grand piano, with several new adjustments, appears to possess some advantages; it is of good tone, and high finish.

The examples of the raw materials of this country appear, however, to be of a more really interesting character than any of the more finished and highly elaborate productions.

The plumbago and iron ores, both of them remarkable for their purity and richness, pig-iron, steel, &c., with cotton and other raw produce, are also shown.

Tools, fabrics of various kinds, saddles, books and book-binding, American spring chairs, carved bedstead, &c., are also in this space. Near the Nave is the well-known contrivance for large hotels, by which the room for which the bell is rung is indicated by a corresponding numeral.

Near the outer wall of the building are placed some French agricultural implements and carriages for town use.

At the south-east corner of the building is exhibited a large model of a glasshouse, with eight-pot furnace, large melting-pot weighing one ton, specimens of sheet glass, &c., from Sunderland.

RUSSIA.

A small intervening space between the Zollverein and the space claimed by the articles from the United States, is intended to be occupied by raw produce and materials, principally minerals. Ores of iron and silver, geological specimens, granite, syenite, and other rocks, agricultural produce, &c., will be found in this space. Among the minerals are some large specimens of native gold, copper in ingots, cakes, and sheets, and fine specimens of platinum. Russia being the country from which the supply of the latter precious and important metal is chiefly derived.

Specimens of embroidery, silks, sail-cloth, &c., furs, leather, and wools are also included here.

SWEDEN AND NORWAY.

The mineral wealth of these countries is principally illustrated by the contributions they have forwarded for exhibition.

The iron ores of Bofors and Dannemora, with specimens of the iron produced at these works, commence the series. Tubes, iron-plates, ironware of various kinds, files, and fine cutlery, sabres and swords, show the character of Swedish steel.

Specimens of cobalt and nickel, of much interest in England, from the circumstance that our principal supply of these metals is derived from the mines of Norway and Sweden, are in the collection. Cotton goods made by the hand-loom of the peasantry, and woollen cloth of various kinds, are of considerable interest. Swedish silks and satins, moire faconné, gros de Naples, &c., are among the woven fabrics. A portrait of King Oscar I., woven in silk, being a good example of the use of the jacquard-loom in Sweden.

Specimens of flax, water-retted and broken by hand, and of linen manufactured, such as is made by the peasantry in Angermanland, complete this collection.

DENMARK.

The articles from this country are arranged in a small space near the Nave. Agricultural produce, paper, knitted articles, leather, boots, and some mechanical apparatus, will be found among these objects. From the Royal Porcelain Manufactory, Copenhagen, are exhibited ornamented and decorated vases; decorated dessert-plates, and breakfast cups and saucers; figures, busts, and bas-reliefs, in biscuit, after Thorwaldsen: decorated Etruscan vases, modelled after the antique, exhibited for manufacture; and in contrast with them, specimens of common crockery, called black-pots, made by the peasants of Jutland. Some fine musical instruments, with lace and net, are here also.

GERMANY, AND THE ZOLLVEREIN.

The contributions of a number of states are included under the general term Zollverein. The general character of the articles sent by these states is utilitarian, although many beautiful ornamental articles are also found among their contributions. The space first entered is principally occupied by apparatus, and specimens illustrative of the mining and metallurgic operations which form so important a feature in German industry. Some beautiful specimens of chemical preparations and of rare minerals are exhibited. The specimens of pigments, particularly of smalt and ultramarine, are very fine.

Textile fabrics of various kinds also occupy a large portion of space on this side of the nave. Among them the cottons, calicos, and embroidered stuffs are found, together with the well-known staple articles of the commerce of Saxony, a variety of broad-cloths, of articles of apparel, hosiery, worsted, and woollen stuffs. In this space are also displayed the celebrated wool-work of Berlin, with the paper patterns for ladies' work, with carpets, embroidered stuffs for cloaks, &c. Toward the outer wall of the building is arrayed a rich and important collection of raw materials, in addition to silks, oil-cloths, fancy stationery, and a variety of miscellaneous articles for useful or for ornamental purposes.

AUSTRIA

exhibits a very perfect collection of articles from the raw material to the most skilful manufacture. The raw materials are found near the exterior wall of the building, and furnish illustrations of each of the first four classes into which the Exhibition is philosophically divided. Coal, sulphur, cobalt, and copper are among the important mineral products. The manufacture also of chemical substances is illustrated by various specimens. Lucifer matches are produced in enormous quantities in Bohemia, and are exported to all parts. Playthings for children, fancy articles, mechanical figures, meerschaums, and pipes of various devices are also in this quarter behind the room of statuary. Near the Nave are beautiful specimens of ornamental glass.

The Statuary Room is separated from the rest of the Austrian space for the display of objects in sculpture from Milan and Vienna. At the entrance to this room are some highly wrought marble chimney-pieces. The room contains a variety of interesting statues and busts.

BELGIUM.

The productions of this country contrast remarkably with those of France. The articles of the latter country are such as evince the application of taste, and are calculated chiefly for ornament; but the produc-

tions of Belgium are for domestic use chiefly. They include, however, some beautiful specimens of tapestry, exhibited by the Royal Carpet Manufactory. Shawls, dresses, collars, veils, and handkerchiefs, all exquisitely embroidered, and a variety of similar articles, illustrate the degree of skill with which this delicate textile manufacture is carried on in this country. Woollen manufactures, flannels, cloths, linen fabrics, bleached and unbleached, with the raw materials—flax, tow, and hemp, sail-cloths, damasks, leather, &c.,—occupy the bulk of the space allotted to Belgium on this side. Articles of hardware, fire-arms, artillery, &c., are also among the number. Among the offensive weapons are the celebrated "needle" guns which are considered such destructive arms. Specimens of vegetable and mineral produce are also shown.

FRANCE.

A portion of the large space occupied by France is next in order, on leaving the space occupied by Belgium. The space on this side the Main Avenue is occupied with a great variety of articles tastefully arranged, and illustrative of the peculiarities of French industry. The case containing the splendid jewels exhibited by the Queen of Spain's jeweller, at Paris, attract much notice. A case containing beautiful artificial flowers, made of cambrie, is also interesting. Articles of jewellery, and ornamental articles in fancy woods, pearl, &c., and a great variety of the peculiar class of objects known as "fancy" articles, upon the preparation of which skill and taste are required, together with beautiful specimens of tapestry, occupy the space nearest the avenue.

In the spaces first entered are found beautiful bronzes and fine specimens of working in the precious metals, an art in which the French peculiarly excel. In these spaces also are the articles of decorative furniture, some of which are of great taste and elaborate execution. The French mirrors, which until recently surpassed in brilliance and excellence the best English, are also found here, among sofas, bookcases, girandoles, &c.

Carpets, shawls, merinoes, and other articles of dress are in this space. Beyond are arranged the smaller articles of apparel, boots and shoes, gloves, hats, &c.; and also designs for paper-hangings, chimney-pieces, &c.

SWITZERLAND.

As might be expected, the articles here exhibited are remarkable for the variety of mechanism connected with the watch manufacture, and of watches characterized by the customary ingenuity of the Swiss makers. The watches are, however, placed immediately above in the gallery. Some powerful musical boxes are also generally playing various airs in this space. On the ground floor are displayed those beautiful specimens of embroidery and of textile manufactures which have been carried to such a point of excellence by native embroiderers and makers. Among these will be found lace and muslin curtains, muslin dresses, shawls, with needle-work and fringes, &c.; embroidered handkerchiefs and collars; silk pocket handkerchiefs; curtain and bed-cover, muslin and silk, embroidered. Pictures of silk, and embroidered robes of silk.

The art of carving in wood has also been carried to a high degree of excellence in Switzerland, and in illustration of it several beautiful specimens are shown. A lady's mechanical escrutoire, of white wood, which can

be used for writing in a sitting or standing posture. The carved work represents the rustic economy and Alpine life of the inhabitants of Switzerland.

A model of a peasant's farm-house in the Bernese Oberland, with its dependencies, is also exhibited. By removing the roof, the interior, even to the cellar, is exposed to view, with the furniture, &c.

Undressed linens, Turkey red cloths, cotton prints, &c., and muslins occupy the remainder of this space.

TUNIS.

The collection from this country being placed partly in the same space as that occupied by Chinese articles, may be conveniently examined with those. The Tunisian productions are principally remarkable for the large quantity of embroidered dresses and articles of ornamental apparel which are found amongst them. These productions are sent for exhibition by order of His Highness Mushir Basha, Bey of Tunis. Among them will be found the following attractive objects:—

Bornouses, or Moorish cloaks, manufactured at Gerid and Gafsa, and at Kaff. Red caps, called Calabash. Caps, called Orta. Caps, called Sakes. Ottoman court uniform caps, called Majidia. Silk mantles, used by Arabs. Arab veils. Handkerchiefs. Curtains. Gaze dresses. Gaze scarfs. Head coverings, &c. Set of forehead ornaments, used by Arabs for horses. Copper stirrups, used by the Arabs of Derna, &c. Leather bags, for carrying water. Hair cords, for tying horses' feet, &c. Martingales. Hair girths, used for tying up loads on mules. Horse brushes. Tunisian carpets. Parasols, with ostrich feathers. Saddles, embroidered with gold. Domestic implements, viz.:—Copper jugs and waiters. Large boilers. Bucket. Arab wash-hand basins. Earthen cups. Soap boxes. Vases, used for throwing water upon the head in bathing. Bags for feeding horses, used by Arabs. Velvet saddles, embroidered with gold and silver. Plated stirrups, used by Bedouin Arabs. Iron bridle-pieces of different sorts.

In addition to manufactured articles will be found many interesting specimens of minerals, and of dried fruits, so important to the existence of the inhabitant of the East.

CHINA.

The raw products of China are interesting, and comprise, among other articles, vegetable wax, fibre, varnishes, minerals, &c., and edible birds' nests.

The following unique articles are rendered particularly instructive, from the progressive stages of manufacture exhibited:—

A complete collection of the various materials employed at the Great Porcelain Works of Kiaing tih' Chin, in the vicinity of the Poyang Lake, in the manufacture of porcelain. The progress of a porcelain cup may thus be watched from the raw clay to the final painting. Several highly interesting specimens of the perfection of Chinese ceramic art are placed around. The following articles also deserve attention:—

A Chinese printing press. A curious and elaborately finished Chinese bedstead, inlaid with ivory and mother-of-pearl. The original address, with the signatures of 776 merchants and tradesmen, presented to his Excellency Hwang, on his being appointed the deputy governor of the province of Canton, during the reign of the Emperor Keenlung, about the year 1720. A collection of the

various teas exported from Canton, in chests, cases, and boxes. Bronze vases, &c., inlaid, three large and five small. Carved ivory tree, with ball containing 24 others, all from one piece. In addition are many specimens of elaborate carving in wood, lacquered and Japanese ware, with beautiful embroideries, &c.

Ground Floor.—North Side, going East.

TURKEY AND EGYPT.

The areas near the Transept are devoted to the reception of the articles from Turkey and Egypt. From Egypt there is a very miscellaneous collection, consisting of minerals, petrified wood, drugs, dates, rice, wheat, woods, rhinoceros' horns, elephants' teeth, with articles manufactured from native vegetable fibres. There are also embroidered silks, saddles and belts, perfumes, oils, trays, baskets, jugs, and a number of other articles.

The collection from Turkey is rich in all the articles peculiar to the East.

PERSIA.

There are no articles from native exhibitors of this country, but an interesting collection of small objects of Persian production has been formed, and occupies a small space at the corner of the nave, near the Transept. Rugs, carpets, embroideries, and some panels and miscellaneous articles, will be found in this spot to indicate the peculiar products of the country.

GREECE.

The contributions from this country, placed between Persia and Spain and Portugal, are attractive for their collections of raw materials:—emery, sponges, raw silks, honey from Mount Hymettus, beautiful marbles and porphyries, with a few embroideries and bas-reliefs, form the chief noticeable objects. Muslins, embroidered Albanian dresses, &c., are also exhibited.

PORTUGAL AND MADEIRA.

The Portuguese articles sent are found next to those of Spain. The tobaccos, snuffs, and vegetable produce are interesting, and raw materials and agricultural produce occupy the greater part of the collection. Some ornamental articles of furniture, cottons, linens, silks, woollen stuffs, &c.; with fire-arms, porcelain, and articles of jewellery are exhibited. Beautiful specimens of ivory carving, of marbles, marble veneers, table tops, &c., are found in this collection.

From Madeira are sent large bunches of dates, plants, fruits, seeds, minerals, and a few specimens of native manufacture.

SPAIN.

Occupies a part of the building near the staircase by the Transept. There are a considerable number of Spanish exhibitors, and the articles shown are of the highest practical value and importance. A very large proportion of them are raw produce. The minerals are extremely interesting and present many varieties. The vegetable products are not less numerous, and contain many articles peculiar to the country whence they have been sent. Two-thirds of this collection of articles consists of raw materials and produce. Among the manufactured articles is an octagon table of inlaid wood, containing 3,000,000 pieces, the arms of England alone, in a space of 3 inches by 2, consisting of 53,000.

There is also a wonderful sword from Toledo, so elastic

as to bend in a circle with ease; with other beautiful specimens of the famed workmanship of this town.

There is also a slab from the Alhambra.

ITALY.

This collection contains articles sent from Rome, and also from Sardinia and Tuscany.

The minerals will be examined with much interest. They have been collected with much industry, and display very fully the resources of the country. Examples of chemical products, sulphuric and nitric acid, are associated with the sulphur ores, and iron and steel are shown in connexion with the iron ores.

The specimens of silk in all its stages are numerous; and the vegetable products of the country are fairly exemplified. Woven and dyed silks, velvets, and other productions from the looms of Italy are collected.

A considerable portion of furniture, exhibiting the peculiar character of Italian cabinet-work, is shown. In addition, are some good sculptured groups, and some beautiful cameos in shell and onyx. Inlaid marble tables, lace, paintings, &c., are exhibited here.

FRANCE AND ALGIERS.

The conjoint productions of France and Algiers are to be found at the back of the space occupied by Italy. This collection is extremely interesting. It consists of a valuable series of raw produce, tobacco, "vegetable hair" from the palm tree, salt, cotton, new articles of food, raw silk, drugs, &c. Beautiful specimens of Eastern embroidery, dresses, scarfs, &c.; and Si-El-Bey Ben-Bou-Ras exhibits an Arab saddle with gold and silver embroidered morocco covering, and every appendage forming an Arab horseman's equipment.

There are also highly-finished specimens of furniture, cabinet-work in ebony and bronze, carpets, woollen and silk fabrics, &c.

Behind these articles is a portion of space chiefly occupied by the display of the French national manufactures, carpets, and tapestries of the Gobelins ornament the wall, of various sizes and extreme beauty. The famed china of Sèvres is also displayed here, and consists of the following articles, made at the National manufacture at Sèvres:—Pictures and copies of pictures of the great masters done by various artists attached to the Sèvres manufactory. Vases, painted and ornamented. Artistic articles of china furniture. Complete services for tea and coffee. Various articles; enamels. Cups with paintings, in enamel, by various authors.

FRANCE.

The French machinery is arranged on this side, and deserves careful examination. A large number of different machines are exhibited, some of which are of great size. A locomotive, a paper-hanging machine, a large shirt-making apparatus, and particularly a powerful hydraulic engine, called a "turbine." These machines are employed to drive the cotton-spinning machinery of several large factories in France. Some highly finished specimens of philosophical instruments, clocks, balances, &c., are deserving of notice, as are also a pair of large glass doors. Behind are contained a collection of articles belonging to the raw materials, and including chemical substances, leather, &c. There are also several mules for cotton-spinning, with other apparatus for manufacturing textile fabrics.

BELGIUM.

In this space are contained musical instruments in great variety, furniture, cabinet-work, specimens of paper-hanging, carpets, models, large carpets from Brussels, &c.

Behind these articles are agricultural implements, sugar-mills, cotton spinning machinery, models of apparatus, two locomotives, a large marine-engine, and a general assortment of hardware.

HOLLAND

occupies but a small space, but contains a variety of pleasing objects. The most prominent are several very large candelabra of glass supported by bronze figures. There are also contributions representing nearly every variety of manufacture belonging to this industrial people:—metallurgy, metal manufacture, woven fabrics, basket work, clocks and toys, with numerous articles of merit, form the interesting features of this section. A small percussion-cap-making machine, producing them from the ribbon-copper, and a sugar crushing machine, are good examples of machinery.

AUSTRIA.

The decorative furniture sent from Vienna forms the principal attraction of the Austrian collection on this side of the Nave. It is arranged in four rooms, which are entered from the Nave. The floors are of inlaid oak. The furniture of zebra-wood massively carved. The rooms consist of a sitting and dining-room; a library and bedroom. A bookcase of carved oak, intended as a present to Her Majesty, is a prominent object. In one of the rooms is a small fountain occasionally playing Eau-de-Cologne.

Specimens of glass and porcelain, of lithograph and oil printing, are also found outside this suite of rooms, and behind them are arranged machines, steam-engines, tools of all descriptions, hardware implements, carriages, &c.

ZOLLVEREIN.

A tastefully fitted-up room, containing a variety of small articles, and particularly some beautiful chessmen, jewels, vases, and a mirror, the frame of which is of Dresden china. The niches at the four corners are pleasingly arranged.

NORTH GERMANY.

Eastward of the Austrian division are again seen articles of German origin. The furniture in this part is very interesting and completely characteristic. Bucksborn is employed for almost every purpose, and is formed into very fantastic shapes. In addition to the horn, inlaid ivory is also largely employed for furniture decoration. Textile fabrics, models, &c., are also found here.

The celebrated porcelain manufactures of these states are illustrated in the articles exhibited by the ROYAL PRUSSIAN PORCELAIN MANUFACTORY of Berlin, such as vases, with paintings after Peter Vischer, Mieris, Slingeland, Von Klöber, and Bellerinann. Chandeliers of a green body, with biscuit figures upon a bronze socket, and pedestal of alabaster; punch-bowl, with painting, after Hogarth; flower-vessel, after Watteau, &c.

In addition are specimens of ornamental glass, bronzes, &c., and behind are sugar-boiling apparatus, stones, and machines.

RUSSIA.

The collection on this side differs from that on the opposite, and consists of a number of beautiful ornamental articles. Large porcelain vases from St. Petersburg, with beautiful paintings on them, will attract notice. Some fine examples of parquetry work and a pair of highly-wrought candelabra are also prominent objects, together with some vases in jasper, and one of beautiful appearance in copper. A cabinet of tasteful execution, Florentine mosaics, and Caucasian weapons will also be noticed.

UNITED STATES.

The characteristic productions of America are almost exclusively those of direct utility, and little attempt at ornament is visible in the articles exhibited, a circumstance which renders the contrast between the articles of this vast country and those of European or Asiatic origin extremely curious, since in the latter the most elaborate efforts to communicate beauty of form to objects of utility are manifested. The machinery is placed on this side of the Nave. Among these are a set of punching machines of considerable power. A caloric engine is also exhibited. A large iron safe is also here, said to be so constructed that no person but the inventor can open it. Several kinds of agricultural implements, ploughs, &c., are exhibited, and some very light and elegant carriages, with stoves and grates of various descriptions.

India-rubber manufacture is largely illustrated; amongst other things, by a model of an India-rubber life-boat, made to be put in a person's pocket, six feet long, and three feet wide, and India-rubber pontoons.

On the walls are school and educational maps and drawings.

The space behind the American articles belongs to Zollverein and Belgium, and contains a few miscellaneous objects.

The Refreshment Court, &c., is also behind this part of the Exhibition.

Galleries.—North Galleries, going East.

The Galleries are reached by ascending the staircases on either side of the Nave. There are three staircases on each side, which render the approach to any part of the Galleries, or the descent from them, at different points of the building, commodious to the visitor. Standing near the Transept, two galleries are seen stretching toward the east, which must be examined, to the neglect at present of the miscellaneous manufactures of the United Kingdom occupying the gallery spaces near the Transept. To these we shall afterwards return. The two Galleries are called, respectively, the Central North and the North, the former being nearest the Nave, and the latter next to the exterior of the building, and occupied chiefly by an exhibition of stained glass.

As a general rule, the countries occupying the ground-floor beneath have a portion of space immediately above that occupied below; but to this rule exceptions exist. Commencing therefore our study with that of the Central North Gallery, and walking eastward, metallic and other bedsteads are encountered, which, with their furniture, indicate that they are not of British origin; belonging, in fact, to Spain and Portugal. Beyond this, some of the articles sent by SARDINIA are met with. The Sardinian exhibitors are nearly one hundred in number, and have furnished an interesting collection. Specimens of their

skill in the manufacture of silver ornaments are seen in this Gallery. Upon a silver plate is encaused a portrait of the King, and upon another, one of the Queen of Sardinia. The silver flagree work is particularly pleasing and attractive. This comes chiefly from Genoa—one exhibitor sends a column ornamented with emblems intended to celebrate the era of the great Exhibition of 1851. Another, a ship in silver flagree.

Interest will also be excited by some dies employed for stamping "dorini," a kind of small gold ornament worn by the peasant women in Piedmont.

The cases next met with contain some of the lighter BELGIAN productions. Exquisitely wrought specimens of lace, in a variety of forms, and of wonderful execution, are contained in a number of glass-cases extending along this Gallery. The thread of which the finest lace is made is the most delicate filament produced by human skill. Its tenacity is so extreme that it cannot be untied, it is said, during turbulent weather, when the currents of air would be likely to injure its continuity. Of the costliness of lace made from such thread, an idea may be formed when the labour of producing the latter is taken into consideration. A beautiful lace dress of immense value will attract notice among these articles.

Beyond are specimens of embroidery in gold from AUSTRIA (Vienna), with clothed figures. Specimens of the perfection of the art of working in gold and silver lace, epaulettes, sword-handles, &c. from Louvaine, with a variety of rich fringes, are next in order.

The Austrian musical instruments follow next. The extent of the musical department in Austria is an indication of the fondness of its inhabitants for music, and the extensive demand for musical instruments resulting therefrom.

Vienna and Prague are the principal seat of the manufacture of stringed and wind instruments, which are articles of considerable export. Also in other parts of Bohemia and the Archduchy of Austria, and in Lombardy, excellent musical instruments are made.

Harmonicons, both large and small, the latter of which are rather to be considered as toys, are extensively made in Vienna of good quality, and are largely exported. Musical boxes from Prague are also exported in large quantities.

A variety of PRUSSIAN articles succeed to these. Among them is an elaborate and tastefully-executed carved side-board, the production of which must have been attended with an immense outlay of time and labour. A grotesque chandelier also attracts attention, in which are represented various figures in the attitude of musical performance. Specimens of basket-work, gilt ornaments, mirrors, and miscellaneous fancy articles, such as card-cases, purses, and ornamental wood-work, follow this. A fine model of Magdeburg Cathedral deserves inspection.

Over the space on the ground-floor, occupied by Russia, is a display of epaulettes, feathers, shawls, &c., and some philosophical instruments. And over that occupied by the United States is a variety of articles made from caoutchouc, such as railway springs, tubes, &c., and a new water-proof coverlid, intended for the use of military men, and others camping in the open air at night. Beyond is an extensive collection of soap and perfumery. That which will attract notice most is a window made of soap, the panes being formed of thin plates of alternately red and yellow soaps. These are sent hither from Philadelphia.

The end of the Central North Gallery has now been reached. Upon the wall opposite its termination, are displayed a selection of beautiful paper-hangings, manufactured by British exhibitors; some of them are in imitation of panels of wood, &c.

The North Gallery may now be examined. It is devoted chiefly to the display of British and foreign stained glass; and carpets, &c., are hung on the opposite side, in order to obviate that confusion of lights which would annihilate the beauty of these productions. Several new methods of painting in glass are illustrated. In one instance large plates of glass are shown with figures which, in the distance, resemble statues in marble. Specimens of stamped and embossed glass are also exhibited.

The spaces connecting the galleries are occupied by specimens of glass, china, and porcelain; by statuettes and figures in various metals; by some models from Hamburg, specimens of bookbinding, model of a crane bridge, china, &c., and by miscellaneous and fancy articles.

The interval between the galleries is devoted to seats for spectators.

South Galleries, going West.

Having reached the eastern termination of the galleries by the north galleries, the two south galleries may be now seen by proceeding westward toward the Transept. The eastern termination of the south galleries is only partly occupied, the wall space being covered with paper-hangings and specimens of decoration; a large area is however covered with plates, extracted from a very remarkable work published by the French Government, and forming a complete history of the art of painting, with specimens from the earliest productions known. This work has occupied a quarter of a century in its production, and remains still incomplete. The plates are coloured in precise imitation of the original; sixty of these plates are now published: only six copies of the work have been issued. French billiard-tables, elaborately ornamented, with their fittings, attract notice. The French instrument-makers exhibit specimens of their ingenuity in surgical instruments of every conceivable form, with a figure representing their application to the human frame. Artificial teeth, and anatomical preparations, casts and figures, together with specimens illustrating veterinary anatomy, are among the objects next met with.

In the Central South Gallery (nearest the Nave), Saxony exhibits, in a space parallel with the French articles, an interesting collection of philosophical and musical instruments; one of these is an electro-magnetic telegraph.

These telegraphs have been in use on the electro-telegraphic lines of Saxony and Bavaria since the year 1847.

The Zollverein has also lately been attempting to compete with Switzerland in the manufacture of watches, by the division of labour, and some of its results are now exhibited.

The manufacture of musical instruments in Saxony is interesting, and has its seat in some little towns, namely, Markneukirchen and Klingenthal, in that part of Saxony called the Voigtland. This department of industry is distinguished partly by the extreme cheapness of its products (especially string-instruments), partly by superiority of construction and execution (especially wind-instruments). The products are exported in great quantities. The manufacture of string-instruments is usually united

with that of wood-combs, which gives sometimes employment to part of the less skilful workmen.

Articles of a lighter kind, such as muslins, laces, and embroideries, are also here exhibited.

The manufacture of laces, sewed and embroidered net and lace articles, is a very old branch of the Saxon industry, forming the principal occupation in the mountainous parts of the Erzgebirge and Voigtland, where wages are extremely low. The number of persons engaged in it amounts to many thousands, chiefly women, girls, and boys; also aged and labouring men during the winter. The merchant manufacturers that collect their products, and who provide the workmen with the patterns and the materials, reside generally in Eibenstock and Sneeberg, or in some small neighbouring towns and villages.

Saxony also exhibits a variety of preparations of chocolate, some of which are moulded into elegant forms. One of these, the monument of Arminius, weighs 50 lbs. The Nelson monument weighs 5 lbs.

Beyond these are some of the Prussian productions—fine specimens of unbleached damask and other table-cloths, and of damask linen generally. Near this are also some philosophical instruments; anemometers, rendered self-registering by the application of electro-magnetic apparatus, balances of extreme delicacy, weighing with accuracy from the sixty-fifth part of a grain, up to 2½ lbs. avoirdupois, and Daguerreotype apparatus are also exhibited.

Returning to the South Gallery (near the exterior of the Building), a considerable space is found to be occupied by English exhibitors. The articles here deposited are of a miscellaneous character, and comprise the following:—patent beds for marine use, objects illustrative of nautical and aquatic pursuits, among these the wager-boats of the Thames, with their surprisingly light construction, will attract attention: there are also models of boats, of yachts, a case of stuffed birds, boats made of India-rubber, and capable of being stowed away into a very small compass, a portable room of furniture, and other articles of furniture, a patent self-supporting pulpit, boots, shoes, rugs, &c. Upon the wall are hung specimens of paper-hanging and decorative designs for the interior of buildings.

In the parallel space in the Central South Gallery are a series of musical instruments, exhibited by Prussian contributors. One of these is an organ, fitted up in a tasteful and elegant manner. Beyond these are Cashmere shawls, embroidered silks, lace, velvets, satins, ribbons, figured silks, and shawls of Austrian production, arranged in glass cases, in a manner well calculated to exhibit the extreme beauty of their texture and colouring.

In the parallel space to the last productions, and in the South Gallery, are miscellaneous articles of Austrian exhibitors—surgical apparatus, fowling-pieces exhibiting elaborate workmanship, philosophical instruments, and beyond these, selections of ribbons, hats, and straw hats. The wall space is occupied by oil-cloths and table-covers.

Beyond these, in both galleries, are the French productions, of a lighter and also of a miscellaneous kind. In the exterior (South Gallery), are found brides and harness of costly workmanship, saddles, wigs, head-dresses, curbs, feathers, and flowers, with dolls, and some beautiful lace shawls. In the Central Gallery are the magnificent productions of the silk looms of Lyons. Nearer the Transept are cases containing delicate specimens of the lace manufacture of France, with satins, muslin dresses, light shawls, and pleasing arrangement of muslin fabrics.

The South Gallery from this point (about P. 54 marked on columns), up to its termination at P. 43, contains a series remarkable in its kind as strikingly illustrative of the peculiar taste and excellence of French productions in textile fabrics. Muslins, lace, lace dresses, and shawls, are among the lighter articles; cordage, sail-cloth, flax, and table-cloths among the heavier. Muslin curtains, cambrics, and silks, furniture, stuff, and shawls follow next, and exhibit the taste of the artist and the skill of the manufacturer. The festoons of printed cottons and muslins, gracefully arranged near this space, must attract general notice and admiration.

The Central South Gallery contains somewhat similar productions, but generally of a more costly description: satins, fine muslin dresses, beautiful ribbons, flowers, and feathers. At the transept termination of this gallery are costly embroidered velvets and satins, embroidered ecclesiastical vestments, and a variety of elegant Parisian articles of ladies' apparel.

The Swiss articles occupy the space extending from the transept end of the Central South Gallery to 42 in the columns. These possess a peculiar interest. The principal articles exhibited are articles made of straw, and watches and watch-jewellery. The articles made of straw—contained in a glass case—consist of flowers, plumes, and wreaths, and of ladies' bonnets. These articles are manufactured principally in the canton of Argovia, and that of Friburg. The straw is obtained from wheat grown in the immediate locality, and is exhibited as prepared for the operation of plaiting. A tasteful arrangement of various kinds of plaits gives attraction to these articles. The lever-watch manufacture is carried on in various cantons, but particularly in the canton of Vaud, and that of Neuchâtel. A large number of persons are occupied in it, and an organized system of divided labour is adopted. The workmanship of the watches is extremely beautiful, but it differs from that of our own country in its want of solidity and durability. Many very curious watches are exhibited. One watch of ordinary size goes for a year without requiring to be wound up, others exhibit the astronomical phenomena; small chronometers only an inch in horizontal diameter are also shown. Beautiful specimens of engraving and watch enamelling are found among these productions. The objects which attract greatest attention generally are two of the most minute specimens of constructive skill probably ever put together: one of these is a minute pistol, which to be seen properly must be examined with a microscope, and on such inspection, appears perfect in all its parts. It is contained in a beautiful silver case; the other is a wonderfully minute watch, stated to be the most diminutive ever made.

At the extreme termination of the Central South Gallery a beautiful view of the Transept can be obtained, and a striking scene presented to the spectator. In the midst is seen the Fountain of Glass; behind it, and also in groups near the south entrance, are beautiful tropical plants, sheltered by the elm-trees which rise above them; and above all springs the light and elegant arch of the wonderful Transept. The glitter of the falling waters in the gleaming light which pours down unobscured in this part of the building, and the artistic arrangement of the groups of objects of art and industry in the immediate vicinity of the Transept, renders this a peculiarly attractive part of this immense structure. Having now taken a hasty survey of the contents of the eastern half of the Building, it may be well to examine those of the Transept.

TRANSEPT.

The TRANSEPT may be divided, for convenience, into two portions—considering the Glass Fountain to represent its centre—into the half on the southern side, and the half on its northern side. Immediately on entering the doors of the Transept some highly ornamented cast-iron gates are exhibited, by Messrs. Cottam and Hallen. On passing these, a beautiful selection of stove-plants are found, the odour of which is extremely agreeable. The objects contained in this section of the Transept should now be inspected.

Fighting horses. Jealousy of Oberon. Ariel. Puck. Titania.

A Nymph preparing for the Bath. A Youth resting after the Chase.

Satan tempting Eve.

Satan vanquished by the Archangel:—"And he laid hold on the dragon, that old serpent, which is the Devil and Satan, and bound him a thousand years." Rev. xx.

Statue of Victory, modelled by Professor Rauch, of Berlin. In Carrara marble. Executed at Carrara.

"The archangel Michael, having subdued Satan."

The Jealousy of Medea.

Alfred the Great receiving from his Mother the book of Saxon poetry.

Her Majesty on her favourite charger, "Hammon."

Group in marble. An episode in the history of the war between the Amazons and the Argonauts.

Colossal group of Virginius and Daughter, marble.

Young Girl at the Spring.

The Suppliant. Statue of the Marquis of Wellesley.

Resting after a run. A Sleeping Child and Dog.

Cupid, statue in marble. Eve, a model. Girl praying.

Over the central door of the South Entrance is the dial of the ELECTRIC CLOCK, the large hands of which present a singular appearance on the exterior of the Transept. The conventional form of a dial has been dispensed with externally, and the interspaces between the radii of the front of the Transept have been fitted with numerals representing the hours. The works which move this clock and others in the Building, are in the Gallery immediately beneath it. The galvanic-battery is the source of power, and the works are seen through the plate-glass sides of the frame enclosing them. From the pendulum of this clock any number of dials may be worked with undeviating accuracy. The greatest novelty consists in the method of giving the impulse by means of a remontoir escapement, by which the variations of the battery take no effect on the time measured. The large clock in the Transept is in connexion with the one over the door, and an ingenious method of locking the escape wheel is adopted, to prevent the train from running by the action of the wind on the hands. This clock is the invention of Mr. Shepperd, and a minute description of it, accompanied with explanatory drawings, will be found in the "Official Illustrated Catalogue."

Dante's Beatrice. "Guardami ben; ben son, ben son Beatrice."

The CRYSTAL FOUNTAIN, in the centre of the Transept, and of the building, is, in all respects, a remarkable work. It is 27 feet in vertical height, and is formed of very pure and colourless cut glass. The tubes conveying the water, with the central pillar, are silvered, and the cutting of the glass has been so skilfully arranged as to render them

altogether invisible. The quantity of glass employed in its construction has been about 4 tons, and the glass employed is of the finest quality. Several different forms can be given to the *jets d'eau*, but the height of the fountain precludes the possibility of deriving a tall stream of water from it, in consequence of a want of proportionate space in the basin below. The fountain was made by Messrs. Osler. To the north of this fountain the following statues and other objects may be seen:—

Equestrian statues of Her Majesty and of H.R.H. Prince Albert, full size, designed for bronze.

Model of the "Queen," man-of-war.

Model for statue of Lord Falkland, executed in marble for the New Palace, Westminster.

A deer stalker. Group, Abel and Thirza. Adam.

A colossal group: The Murder of the Innocents.

Statue in plaster of Paris: The Forsaken.

Sampson bursting his bonds.

The dying Shipwrecked Sea-boy.

Plaster cast of Apollo Belvedere, from the original, to imitate marble.

Group in Plaster: Rizpah watching over the dead bodies of her sons.—2 Samuel, xxi. 10.

Deer stalking, and colossal head of a horse.

Statue in Plaster: Prometheus chained to the Rock.

Model of a colossal statue of the Duke of Wellington.

Youthful Athlete.

Group: Milton and his Daughters.

Model, life size: Figure with torch, &c.

Model: Jacob and Rachel. Sin Triumphant.

Model for a statue of Hampden, executed in marble for the New Palace of Westminster.

Youth at a Stream.

Fountain and hydraulic ram.

Collection of stuffed birds and animals.

A collection of palms and other tropical plants.

Ornamental fountain of cast-iron, bronzed; Cupid and the Swan.

Ornamental park entrance of cast-iron, bronzed; consisting of a pair of principal gates, and two side gates, hung on iron pillars of new construction; each of the four gates was cast in one piece.

Large vase for flowers, designed by Baron Marochetti, in terra-cotta. Encaustic and other tiles. Flower-pots, &c., with Parian bas-reliefs, after Thorwaldsen.

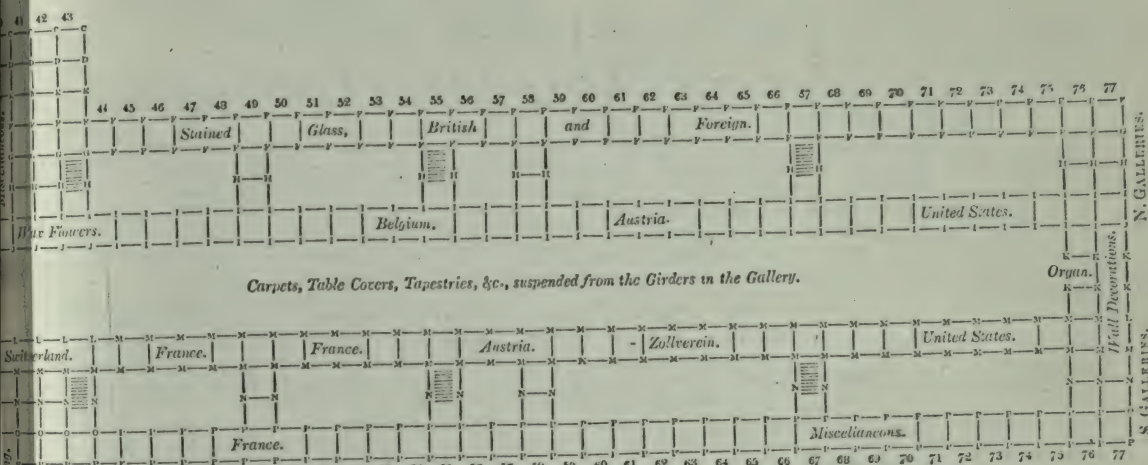
Closed cases of exotic ferns, cacti, and other plants.—These cases are very interesting as the result of a singular discovery, that even in the unhealthy atmosphere of towns delicate plants can be successfully cultivated. They are also extensively employed, and with almost uniform success, in conveying living specimens of plants from one country of extreme temperature to another.

At the North Entrance is the Central Refreshment Court, and at one corner Her Majesty's temporary room. Through this entrance Her Majesty and His Royal Highness Prince Albert, with the Prince of Wales and the Princess Alice, attended by their suite, passed to the State opening of the Exhibition on May 1st.

Returning now for the purpose of examining the western or British portion of the Great Exhibition, the contents of the MAIN AVENUE may be successively inspected.—See page 19.

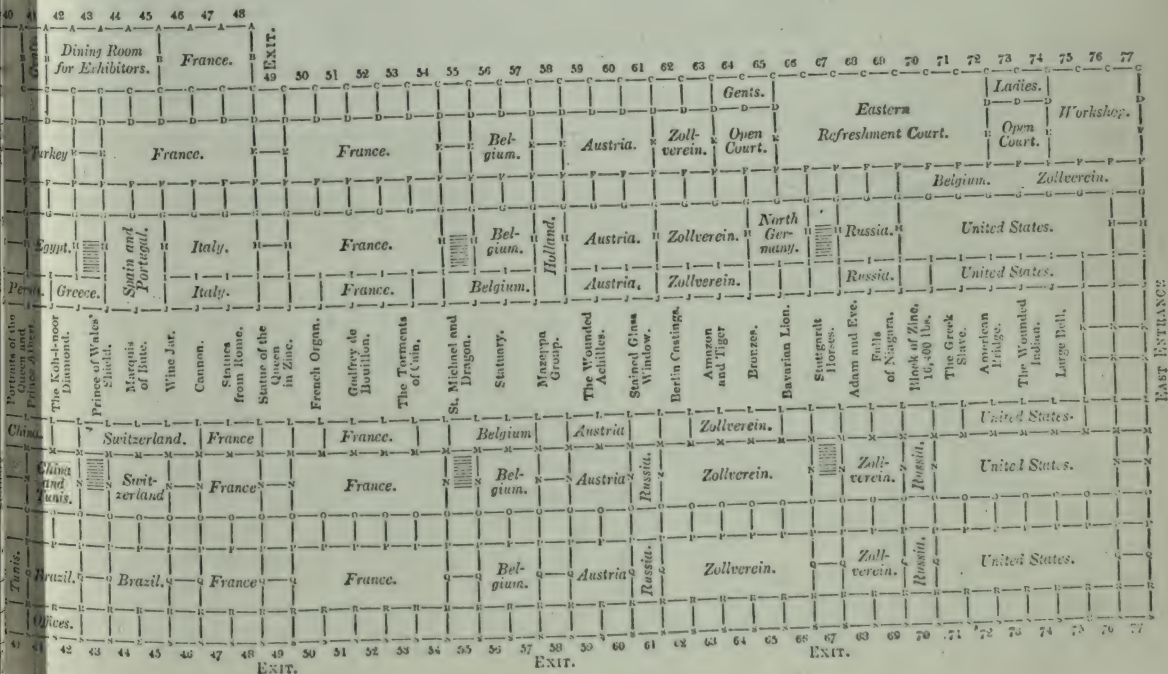
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[The Articles are divided into Classes and Nations, and the Names of such Classes and Nations are given on the Plan, and marked upon the iron girders of the Building. The size of the Plan to the Building is as 1 foot to 1851 feet.]

FLOOR.



UNITED KINGDOM AND COLONIAL POSSESSIONS.

ARTICLES EXHIBITED BY HER MAJESTY THE QUEEN, H.R.H. THE PRINCE ALBERT, AND H.R.H. THE PRINCE OF WALES, IN THE FOUR SECTIONS OF THE EXHIBITION.

Portrait of Her Majesty on Sèvres china, size of life, half length, by A. Ducluzeau, after a portrait by F. Winterhalter. Painted in 1846.

Portrait of H. R. H. Prince Albert, on Sèvres china, size of life, half length, painted by A. Bezanget, after a portrait by F. Winterhalter. These portraits are exhibited jointly by Her Majesty and H. R. H. Prince Albert.

The Great Diamond of Runjeet Singh, called "Koh-i-Noor, or Mountain of Light."—*Main Avenue, East.*

Jewel case in the cinque-cento style, designed by L. Gruner, Esq., and executed at the manufactory of Mr. Henry Elkington, at Birmingham. The material is bronze, gilt and silvered by electro-type process; upon this case are portraits on china of Her Majesty, H. R. H. Prince Albert, and H. R. H. the Prince of Wales, copied from miniatures by R. Thorburn, Esq., A.R.A. The small medallions, representing profiles of their R.H.'s the Princes and Princesses, were modelled from life by Leonard Wyon, Esq. (not yet received.)

Table of gold and silver electro-plate, manufactured by Messrs. Elkington. The top of the table is an electro-type reproduction of a plate of fine workmanship, obtained and copied for Mr. H. Elkington under the direction of the Chevalier de Schlick. The eight subjects in bas-relief represent Minerva, Astrologia, Geometria, Arithmetica, Musica, Rhetorica. The centre figure represents Temperance surrounded by the four elements. At the bottom of this plate is an inscription pointing to the artist. The table is designed by George Stanton, a young artist in the employ of Mr. H. Elkington, and a student in the Birmingham School of Design.—*Class 23.—Central South Gallery.*

A cradle carved in Turkey boxwood by W. G. Rogers, and designed by his son, symbolizing the union of the Royal House of England with that of Saxe Coburg and Gotha. One end exhibits in the centre, the armorial bearings of Her Majesty the Queen, surrounded by masses of foliage, natural flowers and birds; on the rocker, beneath, is seen the head of "Nox," represented as a beautiful sleeping female, crowned with a garland of poppies, supported upon bats' wings, and surrounded by the seven planets.—*Class 30.—Fine Art Court.*

The other end, or the back of the head of the cradle, is devoted to the arms of H.R.H. Prince Albert; the shield occupies the centre, and round it, among the arabesque foliage, the six crests of the Prince are scattered, with the motto "Treu und Fest." Below, on the rocker, is discovered a head of "Somnus" with closed eyes, and over the chin a wimple, which, on each side, terminates in poppies.

In the interior of the head of the cradle, guardian angels are introduced; and above, the royal crown is found embedded in foliage. The friezes, forming the most important part of the sides of the body of the cradle, are composed of roses, poppies, conventional foliage, butterflies, and birds, while beneath them rises a variety of pinks,

studied from nature. The edges and the insides of the rockers are enriched with the insignia of royalty and emblems of repose.—*Class 30.—Fine Art Court.*

Axminster carpet, designed by L. Gruner, Esq., and manufactured by Messrs. Blackmore Brothers, at Wilton, for Messrs. Watson, Bell, and Co.—*Class 19.—South Gallery, P. 15 to 17.*

A pair of richly cut crystal glass candelabra, 8 feet high, carrying 15 lights each. The shaft composed of prisms upwards of 3 feet in length. Designed and manufactured by F. and C. Osler, of Birmingham, and 41, Oxford Street, London.—*Class 24.—Central North Gallery, I. 27.*

Axminster carpet, designed by L. Gruner, Esq., and manufactured at Glasgow, for Mr. Dowbiggen.

A Berlin-wool carpet executed by one hundred and fifty ladies of Great Britain. The dimensions of this carpet are thirty feet in length, and twenty in breadth. The carpet has been produced in the following manner:—The pattern, originally designed and painted by the artist, has been subdivided into detached squares, which have been worked by different ladies, and on their completion, the squares have been reunited, so as to complete the design. In the pattern, which consists partly of geometrical, and partly of floral forms, heraldic emblems are also introduced. The initials of the executants are ornamentally arranged, so as to form the external border. The whole design is connected by wreaths or bands of leaves and foliage, the centre group representing the store from whence they have been distributed.

The carpet has been produced under the management of a Committee. The design by Mr. J. W. Papworth; the patterns were painted and the work executed under the superintendence of Mr. W. B. Simpson.—*Class 19.—Central North Gallery, I. 30.*

HIS ROYAL HIGHNESS PRINCE ALBERT.

Group in marble, "Theseus and Amazons," executed at Rome, by J. Engel, Esq., from Hungary, pupil of the Royal Academy.—*South Transept.*

Three samples of grain, grown on the royal farms at Windsor, consisting of wheat, oats, and beans, one bushel of each.—*Class 3.*

Specimens of wool, &c.—*Class 4.*

A block of Parrot coal from West Wemyss colliery, Kirkcaldy, Fifeshire, partly polished.—*Class 27.*

Garden seat, designed by L. Gruner, Esq., and executed in Fifeshire by Thomas Williams Waun, of Parrot or canal coal, from the estate of Rear Admiral Wemyss.

Two slabs for tables, designed by L. Gruner, Esq., in the cinque-cento style, executed by Mr. Thomas Woodruff, at Bakewell, in Derbyshire stones, in imitation of the Florentine mosaic.—*Class 30.*

Candelabrum in the cinque-cento style, designed by L. Gruner, Esq., modelled by Ant. Trentanove, and executed in scagliola in imitation of giallo antico, by L. Romoli.—*Class 30.*

HIS ROYAL HIGHNESS PRINCE ALBERT,
ON BEHALF OF H. R. H. THE PRINCE OF WALES.

Shield presented by His Majesty the King of Prussia to His Royal Highness the Prince of Wales, in commemoration of the baptism of the infant Prince, for whom His Majesty acted as sponsor.

The pictorial embellishments of the shield, the general plan for which was given by the king himself, were designed by Doctor Peter Von Cornelius, and the architectural ornaments by Counsellor Stüler. The execution of the remaining portions—goldsmiths' work, enamel, &c., was performed by M. G. Hossauer; the modelling by M. A. Fischer; the chasing by M. A. Mertens; and the lapidary work by M. Calandrelli.

In the centre of the shield is a head of our Saviour. The middle compartment, surrounded by a double line of ornamental work, is divided by a cross, into four smaller compartments, which contain emblematic representations of the two Sacraments, Baptism and the Lord's Supper, with their Old Testament types—the opening of the fountain in the rock by Moses, and the Fall of Manna. At the extremities of the arms of the cross are represented the Evangelists, noting down what they have seen and heard, in the Gospels, which are to communicate to all futurity the plan of man's salvation, and prove inexhaustible sources of divine revelation and doctrine.

On the extreme points of the arabesques that rise above the Evangelists, are represented the Christian virtues of Faith, Hope, and Charity, and of Christian Righteousness. Around the entire centre stand, in a circle, the twelve Apostles. Peter is seen under Faith represented in the arabesque; on the right and left of him are Philip and Andrew; under Hope, is James; on either side, are Bartholomew and Simon; John is placed beneath the figure of Charity; on either side, are James the younger and Thomas; under Righteousness, is Paul; on the right and left, are Matthew and Judas Thaddeus, going forth into the world to teach and to baptize, and to propagate the kingdom of the Redeemer.

The relieve which surrounds the edge of the shield represents the betrayal, the redeeming atonement of Christ, and his resurrection. Another portion represents our Lord's triumphant entry into Jerusalem; a third portion, the descent of the Holy Ghost, the preaching of the Gospel, and the formation of the Church. The fourth and principal compartment contains an allegorical representation of the birth of the Prince of Wales and of the visit of the king of Prussia, accompanied by Baron Humboldt, General von Natzmer, and the Count von Stolberg, and welcomed by His Royal Highness Prince Albert and the Duke of Wellington; a knight of St. George being represented on the beach standing upon a dragon.

The shield has been denominated the Buckler of Faith. The inscription on the shield runs thus:

"FRIDERICUS GULIELMUS REX BORUSSORUM,
ALBERTO EDUARDO, PRINCIPI WALLIE,
IN MEMORIAM DIEI. BAPT. XXV. JAN. A. MDCCCXLII."

Main Avenue, going West.

Venus and Cupid.

Bronze figure: Youth at the Stream, after Foley.

Cast, in bronze: The Eagle Slayer.

Silk trophy, by Miss Keith.

Group, in bronze: The Horse and Dragon.

Bronze statue of the Duke of Rutland, for the market-place at Leicester.

Sir William Follett, colossal statue.

Large collection of specimens of Canadian and Van Diemen's Land timber. Lower jaw bone of sperm whale.

Group and pedestal, mosaic sculpture: "The faithful friend of man trampling underfoot his most insidious enemy."

Model of the interior of Her Majesty's Theatre.

Madonna and Child.

Restoration of the monument of Phillippa of Hainault, Queen of Edward III. in Westminster Abbey, executed in English alabaster.

Gothic monument and Purbeck marble tablet, with emblazoned inscription in early English character.

Large looking-glass and console table, ornamented and gilt.

Monumental brass for an altar tomb: The story of the Good Samaritan.

Spandril and brass lectern for Hereford Cathedral.

Gothic monument, of the decorated style, period fourteenth century.

Monumental tablet in brass, to the memory of the officers of Lord Hardinge's staff, who fell in the battles of the Suttlege; produced by direction of Lord Hardinge, and intended to be sent to India.

Monumental brass.

Model of the orchestra of the Sacred Harmonic Society, Exeter Hall.

Model of the New County Assize Courts, erected at Cambridge; the principal front of Whitby stone, and the fittings of the interior of oak.

Models by Salter of cast-iron bridge over the River Aire, and suspension aqueduct over the River Calder at Stanley, Yorkshire.

St. Nicholas Church, Hamburgh, now being rebuilt.

Railway bridge across the Ouse at Selby, Yorkshire.

Dinting Vale viaduct on the Sheffield and Manchester Railway.

Model in card of the new church of St. Mary and St. Nicholas, at Wilton.

Statue of Rosamonda.

A Fountain:—Acis and Galatea, by J. Thomas.

Polished columns of Madrepore marble. Various specimens of marbles, rough, polished, and manufactured.

Monumental Cross, executed in Caen stone.

Specimens of Jordan's machine carving: Altar screen designed by W. Harris, chairs, carved trophy of birds, foliage, statuettes, &c.

"Multum in Uno," forming loo, bagatelle, and chess-table.

Eldon and Stowell group, representing John, first Earl of Eldon, for nearly 25 years Lord High Chancellor of Great Britain, and William Baron Stowell, 29 years Judge of the High Court of Admiralty. Des. and Mod. by the

late Musgrave Watson, and executed by G. Nelson. Each statue is wrought out of a single block of marble, and the whole weighs 20 tons.

- Large slab of Honduras mahogany.
- Large specimens of crystallized alum.
- Sulphate of copper, &c.
- Large crystallized mass of refined spermaceti.
- Large specimens of crystallized alum.
- Turret clock, by Dent.
- Patent pressure filter and fountain.
- Corinthian capital, in papier-maché.
- Rodger's glass case, containing specimens of cutlery.
- Polished iron radiating stove, by Jobson.
- Chimney-piece in white marble, with or-molu ornaments, by J. Thomas. Statuettes.
- Polished steel stove, or-molu mountings.
- Swedish ventilating stove grate.
- Stove and lamp.
- Unfinished statue of Shakspeare, by J. Bell.

Ornamental rustic dome of cast-iron, bronzed, 20 feet in diameter by 30 feet high; adapted for glazing, as a greenhouse, &c., from the design by Charles Crookes & J. Bell; it contains an iron casting of the Eagle-slayer, and is surmounted by a statuette of Æolus, by John Bell. Garden-seats, chairs, &c.

The Mourners.

Improved patent catoptric apparatus for a lighthouse of the first class.

Dioptric apparatus of the fourth class.

Parabolic reflecting lamp.

Vase and pedestal, in cast-iron, coloured and gilt.

Chimney-piece.

Astronomical telescope, the object-glass 11½ inches diameter, mounted on a stand, having equatorial movements and complete adjustments. The optical part wrought by Ross's improved system and machinery. Astronomical telescopes. Improved microscopes, and photographic camera obscura.

Solid astronomical eye-glass.

Talbotypes taken by Ross's photographic camera.

A large collection of skins and furs.

Large collection of court and other plumes, feathers, &c.

Font, executed in marble.

A model of a decorated Gothic church, at Lever Bridge, Bolton, Lancashire, designed by E. Sharpe, architect. The church is almost entirely built of terra-cotta.

Model fountain, with small engine for working it.

Model of Britannia Tubular Bridge, showing the method of raising the tubes, the floating pontoons, scaffolding by which the land tubes were constructed, &c., on a scale of one-eighth of an inch to the foot.

Model of wrought-iron bridge on the South Western Railway, over the Wye, at Chepstow, designed by I. K. Brunel, C.E., now in course of construction by Finch and Willey, of Liverpool.

Model of the wrought-iron bar-chain suspension bridge at Kieff (Russia), now erecting across the River Dnieper; the largest work of the kind hitherto executed.

Fountain, in artificial limestone, designed by J. W. Papworth. Mercury, after Giovanni da Bologna.

Clay model, an original design, liberation of Caracacus.

Models of 3,000 square miles of England, showing portions of Leicestershire, Yorkshire, Nottinghamshire,

Derbyshire, Cheshire, and Lancashire, and of part of the port and town of Dundee.

Model of the Lord Mayor's state barge.

Glass case containing boots and shoes, exhibited by Dowie, Taylor and Bowley, and Gilbert.

Trigonometrical model of the Undercliff, Isle of Wight, from a trigonometrical survey, the vertical heights being on the same scale as the base, by Capt. Ibbetson.

Dioptric revolving lighthouse of the first order.

Limestone model of the breakwater in Plymouth Sound, with silver lighthouse and beacon, made for the Exhibition under the direction of the Lords of the Admiralty. The breakwater was constructed agreeably to a report of the late John Rennie, and of Joseph Whidby, Master R.N.; the light-house designed by Walker and Burgess; with sectional and other models, &c.

Colossal head of a horse, modelled by the Baron Marochetti.

Bust of Prince Albert, in electrotype.

Busts of the Duke of Wellington and Sir Robert Peel.

Model of the Docks and commercial portion of the town of Liverpool, exhibiting a river front of five miles.

Specimens of plate glass, stated to be the largest hitherto produced.

On reaching the western termination of this avenue, it has been recommended to proceed into the cotton-spinning rooms, these are on the right hand. (See page 24.)

Western Half.—Southern Side.—Ground Floor, going West.

Many of the productions of India are arranged near the Transept, on the southern side. At the west is a case corresponding with that on the opposite side of the Nave, containing magnificent jewels; among them an immense emerald of great value, and several very large diamonds, with specimens of gold embroidered vestments and trappings. Picturesque groups of Indian arms, guns, &c., remarkable for their costly and intricate inlaying, are arranged near this part. Near the South Entrance are some beautiful robes in glass cases, to which succeed specimens of skins, leather, and mineral products; the latter are particularly interesting, but require attentive study. Specimens of various kinds of ornamental woods, and vegetable produce, with the all-important indigo, and some chemical and mineral products are found at the back of the space devoted to India, and entered on the left from the Transept south entrance. A large collection of mineral productions is also here exhibited. The manufactures of India, together with silk and weaving machinery, are in the central part of the space, and models of bullock waggons, agricultural implements, &c., are found at the side. Interest will also be excited by the collection of native musical instruments, some of which are of very curious forms. A special study of any part of this Indian collection will be full of instruction.

CANADA.

The articles comprised within the space allotted to Canada are found next to those of the East Indies, proceeding toward the west. A very rich collection of Canadian minerals, including some full-sized specimens of native gold, one weighing a quarter of a pound, is first met

with. The Canadian furniture, much of it made of the wood of the black walnut, and tastefully carved, is also interesting. Furs and leather are important articles of Canadian commerce, and are here shown, together with a collection of agricultural produce. The timbers, of which an interesting group is arranged in the Nave, are also illustrated here. Canadian manufactures in cotton and wool are shown, and indicate the progress of textile production in this colony. Specimens of axes and other implements are interesting as illustrations of the forest life and occupations. The canoe of bark which carried a large party some hundreds of miles down a Canadian river will attract attention. The Canadian sleighs, and the powerful fire-engine, together with native leather dresses, feathers, beads, &c., and the skins and horns placed near the wall, with the sleigh-harness, &c., deserve notice in passing onwards.

AUSTRALIA AND VAN DIEMEN'S LAND.

This country is represented by a valuable collection of articles principally interesting as raw produce, in the space succeeding to the last, toward the West. The woods are especially deserving of attention, such as Muskwood, Myrtle, Pencil pine, Dogwood, Huon pine, with organ-pipes made out of it. The vegetable and animal substances are also valuable, and many of them new to commerce.

NEW ZEALAND.

The raw produce of this country; woods, &c., are contained in the same area with those of Western Australia. Many objects of interest to the naturalist and merchant are found here.

BERMUDA, BARBADOES, BRITISH GUIANA, TRINIDAD, JAMAICA, AND THE EASTERN ARCHIPELAGO.

The articles sent by these possessions are contained within the last in Areas P. 2, and K. 30, 31, 32, and 33, side of the Nave. They deserve study if time permits, and would form an instructive occupation for another visit. Raw produce, and some native manufactures are the principal classes of objects here exhibited.

After passing a group of hardware, locks of various kinds, iron safes, lamps, gas-fittings, &c. the Mediaeval Court is entered by doors, over which are some good specimens of stained glass. The court itself contains specimens of stone-carving, of encaustic tiles, of working in metal and brass, applied to domestic and ecclesiastical purposes.

HARDWARE, CLASS 22.

This important class is found occupying a space between the Canadian articles and the Furniture class, and re-appearing also beyond the latter toward the west, as is seen in the Plan of the Building. It includes every variety of iron goods and general hardware productions. Those made at Birmingham are on one side of the Furniture Court, and those of Sheffield on the other. There exists a manifest distinction between these articles—those of Birmingham and Wolverhampton are locks, tin-ware, articles in brass, with stoves, ranges, plated wares, japanned goods, lamps, metallic bedsteads, tea-trays, gas-fittings, &c.; the productions of Sheffield are principally tools, knives,

razors, and other edge-instruments, with circular saws of great size.

FURNITURE, CLASS 26.

Several beautiful specimens of decorative and useful furniture are found near the Nave, and many more are contained in the court devoted to them. Tables, sofas, chairs, sideboards, and similar articles are comprised within this class, and are represented by a number of highly wrought and tasteful objects. Several large mirrors are placed against the wall, and specimens of decorative panelling for drawing-rooms will attract notice. This class is also represented on the opposite side of the Nave.

WOOLLEN AND MIXED FABRICS AND SHAWLS, CLASSES 12 & 15.

Westward of hardware, the woollen fabrics, shawls, and mixed fabrics are found. These include the following articles: flannel blankets, cloths from Huddersfield, waistcoatings, table-covers, the peculiar productions of Bradford, the tartans of Scotland, cloths from Halifax, Irish frieze, Norwich glove-cloths, &c.

In the space at the foot of the stairs, in Area 9, L., is a Jacquard loom at work, producing embroidered poplins.

FLAX AND HEMP, CLASS 14.

The productions of Irish looms are next met with, progressing westward, and an excellent illustration of the objects comprised within this class, cambrics, damask linen, and linen manufactures of every description, are contained in this space. Some of the ornamental designs of the table-cloths, &c., are extremely beautiful; and the quality of many of the articles is of the finest description.

PRINTED FABRICS, CLASS 18.

The extreme Western areas on this side of the Nave contain specimens illustrative of the art of printing cotton and other fabrics. These specimens are produced in two ways, either by block or by cylinder printing, the latter being a process of great rapidity, and executed by mechanical power; the former a more tedious, but also a more delicate process, and performed entirely by hand. Manchester sends these fabrics in a proportion suggestive of the immense manufacturing resources of Lancashire, and the finest results of many print-works are here exhibited. London and Glasgow also supply illustrations of the art of imparting coloured patterns to fabrics. In addition to cotton goods, printed velvets, table-covers, Bandana handkerchiefs, &c., are exhibited. The progress of the art of calico printing—developed to an extent so enormous in the present day—is pleasingly illustrated by specimens in this class.

AGRICULTURAL IMPLEMENTS, CLASS 9.

A very large space on the South Side of the Building, extending from the Western Wall to the Sculpture Court, is occupied by agricultural and horticultural implements and machines. Some of these implements claim novelty of design, some of operation, others of results; and each it may be presumed has its peculiar points of advantage. The steam-engines used for ploughing will attract much attention; and many are so highly finished as to appear almost too fine for use in the fields. Ploughs, barrows, dibbling machines, and farm apparatus of every descrip-

tion are seen arranged along the space. Many of these have been put into actual operation in the trial yard, and the decisions of the Jury made upon their utility.

SCULPTURE COURT, CLASS 30.

The room devoted to the exhibition of objects in sculpture and plastic art contains many interesting groups and single figures. A number of statuettes in the centre will be considered attractive. A group representing the Royal children with a Shetland pony is also pleasing. At one side of the room is a group representing the baptism of our Saviour; on other sides are portraits in basso-relievo, a statue of Her Majesty, and a large group—the Descent from the Cross.

MINING AND MINERAL PRODUCTS, CLASS 1.

These, though possessing not much external attractiveness, will be an interesting study to those who visit the Exhibition for instruction as well as entertainment. The series, proceeding from west to east, exhibits gems, plumbago, artificial stones, cements, China clays, the material for the manufacture of our chinaware, building stones, granite, marbles, slates, &c. Bituminous shale, with its peculiar product, an inflammable oil, is likewise shown, with products from coal and peat, and specimens of coal of various kinds, anthracite, cannel, &c. The metaliferous ores succeed to these. British, Scotch, and Irish iron ore and manufactured iron. Models of mining apparatus, of apparatus for the working and preparation of ores, for smelting, &c., are also exhibited. Near the termination of this class, a beautiful cake of silver, weighing upwards of 1,200 ounces, and valued at more than 3,400*l.*, is seen. This silver and other specimens of great beauty were entirely extracted from native lead by a process of crystallization.

Upon the wall of this Avenue (S.) are exhibited specimens of geological and other maps, of decoration in mineral substances, and of artificial marbles, with some paper-hangings and collection of ornamental and useful woods.

This completes our short survey of the contents of the ground floor on the south side of the Nave.

Ground Floor.—North Side, going East.

COTTON, CLASS 11.

Articles illustrative of the cotton manufacture are met with at the Western extremity of the Building. The more novel of the useful goods here shown are some seamless articles of wearing apparel, produced by patent machines. There are also quilts, toilet-cloths, bed-covers, cases of reels of sewing-cottons, Carlisle cotton and woollen cloths, muslin curtains from Glasgow, muslin scarfs, &c., together with Edinburgh plaids and other shawls, and some very large damask table-cloths.

The Northern half of the Ground Floor of the British and Colonial side of the Building has now been examined.

CARRIAGES, CLASS 5.

From their large size vehicles necessarily occupy a considerable space in the Building. Some of these are of the most elegant and costly description, and appear scarcely adapted for ordinary use. A variety of ingenious mechan-

ical adaptations are illustrated in them, and many are of entirely new forms. Some large wheels made by machinery are also found in this department. These are placed between the last class and the locomotives.

LOCOMOTIVES, CLASS 5.

These important machines, together with all apparatus relating to railways, are placed to the north of the carriages. Attention will be excited by the varying forms assumed by the engines, according as they are intended for light or heavy traffic. The express engines of the London and North Western Railway Company, and the stupendous "Lord of the Isles," made by the Great Western Railway Company, are strictly examples of mechanical skill, and are interesting in consequence of the difference of gauge between these two important lines of railroad.

FURS, LEATHER, &c., CLASS 16.

Articles in this class succeed those in the last, proceeding eastward, a collection of wigs, head-dresses, &c., are among the articles. A splendid collection of furs of every description, including some exclusively devoted to the use of Emperors and Kings, and some of great costliness is found in this class. To these succeed saddles and harness, whips of various kinds, all articles connected with the horse, and large skins of leather in different states of manufacture.

FURNITURE, CLASS 26.

Near the Nave, a variety of articles of furniture are seen, such as elegant wardrobes, bedsteads, papier maché decorations and articles, tables, chairs, tea-trays, model of a state bed, specimens of inlaid work, and of Irish bog yew furniture. Cabinets of various kinds, screens, &c., are also seen here.

Machinery at Rest.

The space next to that occupied by the preceding class is devoted to machinery of various kinds, but not in motion. The following appear the more prominent objects in this space: an apparatus for aerated waters of a new form; a large and beautifully wrought copper vacuum pan for a sugar manufactory; a patent vinegar apparatus; and a distiller's recording close safe, for the registration of the strength of spirits, distilled; a globular coffee-roaster is also curious. Railway signal-posts occupy a conspicuous position here, and are surrounded by machinery for making bricks and tiles; a safety apparatus for mines; a patent ornamental sawing-machine, &c.

Beyond are several cranes of different kinds for lifting and weighing a patent hydraulic ram, for raising water, &c. The great hydraulic press, employed in raising the Britannia tubes into their places, towers above the other machines. This vast apparatus derives all its amazing force from the upward pressure of water in an iron cylinder, driven in a very small stream from a force-pump. Below are exhibited specimens of the links of the Suspension Bridge over the Danube, at Perth. Further on is the steam-hammer, the power of regulating which is so perfect that it may be made to crush a block of granite at a blow, or to descend only with force enough to crack an eggshell! The patent Derrick crane so importantly employed in the construction of the building, and in lifting

many of the heavy articles of machinery around into their places, is also here exhibited. At the termination of of this space is an interesting and stupendous piece of machinery—a combination of steam engines of the collective power of 700 horses, for marine navigation. The small models of the early application of steam to locomotion are very interesting. Near these are other highly finished marine-engines of sixty and of twenty-five horse power, and other engines applicable to screw or paddle propulsion.

PAPER, &c., CLASS 17.

Proceeding still westward, the space allotted to this class next presents itself. At the entrance on one side is a specimen of paper of enormous length and width, made by the endless machine, with all varieties of paper, and on the other is the envelope-folding machine at work, producing envelopes, completely gummed and folded, at the rate of 2,800 an hour.

Every description of ornamental and fancy stationery is likewise illustrated.

Entering the space, the wonderful progress made in the paper manufactures is illustrated in every direction. Beautiful illustrations of the art of modern book-binding abound, with specimens of typography, and of types of all forms and sizes. Fancy stationery in all its applications is also represented. The most wonderful object in this class is the case of the British and Foreign Bible Society, containing specimens of 165 books, in different languages from the 170 versions of the Holy Scriptures.

FINE ARTS, CLASS 30.

A great variety of objects are included in this class, which are principally deposited in a space next approached in our progress towards the west. The Royal cradle, carved in Turkey boxwood by Mr. Rogers, is near the entrance into this court. Beyond it are beautiful specimens of the art of wood carving, some of which exhibit astonishing skill in their treatment and execution. Specimens of inlaid work, and an enamelled white and gold deal cabinet will attract notice, together with some fine prints on the wall. An interesting series of coloured prints, suspended on the wall, exhibits the gradual progress and perfection of one of these prints, and the results of the employment of stones charged with different colours. Specimens elucidating the art of seal-engraving are found in the centre, and near them some remarkable wax models of Mexican figures. A highly wrought and elaborately carved buffet, called the Kenilworth Buffet, occupies a space at the side of this court. This buffet is made of an old oak formerly growing near Kenilworth Castle. The central compartment and the panels represent scenes well remembered in the Tale of Kenilworth. A little beyond is a model of Shakspeare's house at Stratford-on-Avon, with figures representing the Shaksperian Jubilee. Daguerreotypes and calotypes of remarkable beauty are found here, with specimens of book ornamentation, and colour printing by the oil and water processes. A variety of architectural and other models of different materials are likewise in this space, with designs for lace, carpets, &c. In this class is also a large Bible, with a finely-carved cover in boxwood, representing the Brazen Serpent, and bearing the inscription—"As Moses lifted up

the serpent in the wilderness, even so must the Son of man be lifted up, that whosoever believeth in him should not perish, but have eternal life."

JERSEY AND GUERNSEY.

These small but interesting islands have contributed a variety of articles for exhibition in the different sections, which are contained in Area 30, Avenue I. The objects deserving of notice are geological specimens, chemical products, mechanical models, silk grown in the island of Guernsey, specimens of native apparel, shell-work, and articles made of the vegetable fibre called "han," with a carved sideboard representing King John signing Magna Charta.

CEYLON.

The productions of this island are next to those of Malta, being contained in Area 32 of Avenue I. This collection is chiefly rich in raw produce, in coffee, coconuts, tobacco, cotton, &c., in various minerals, in edible birds'-nests, oils, &c. There are also models of looms, forges, boats, gold ornaments, matting baskets, and specimens of carved work in ebony, ivory, and wood.

MALTA.

The Maltese productions succeed to those of India as we proceed toward the west. The specimens of stone-carving are some of them of much beauty of design. The material used is a peculiar stone, largely employed for various purposes in Malta. There are also singular specimens of the skill of the Maltese in filagree work in the precious metals. The inlaid marble tables are also pleasing productions, sent hither from Valetta. Articles of apparel and some raw produce have likewise a place here.

EAST INDIES.

The spaces near the Transept, on the North and South sides of the Building, are allotted to the display of Indian articles. Among the numerous interesting and attractive objects here deposited are models of various kinds, and particularly of a native pottery factory, with specimens of Indian pottery. Models of agricultural and other implements, of native ships, of Indian carriages, &c., give a lively idea of the peculiarities of Indian industry. The models of domestic utensils in metal are extremely interesting as specimens of workmanship. The peculiar and superb productions of India in shawls, mixed fabrics, and articles embroidered with gold and silver, are also well illustrated in this collection. There are also some rich carpets from Bengal. The most attractive part of the collection is a room furnished in the style of an Indian palace, and containing most gorgeous specimens of gold embroidery. Oriental luxury is here forcibly realized. Externally to this room is a group of figures, in clay, illustrating the castes and trades of the Hindoos. There are also some beautiful specimens of Indian carving, and a state bed intended for presentation to Her Majesty the Queen. Interest is also excited by the appearance of a large gilt wire bird-cage. The beautiful jewels and specimens of gold embroidery of great value at the side of the Nave, protected by the gilded railing, will excite much notice.

Cotton Spinning and Machinery, going East.

The most complete series of cotton machinery is that exhibited in the room at the north-west corner of the Building, which illustrates every process through which this fibre passes from the raw to the manufactured condition. It may be interesting to give a cursory sketch of the operations performed by these beautiful machines. The first process cotton goes through is that of opening and cleaning, which is performed in machines called by various names, such as a *willowing machine*, or in a *batting*, or *scutching* and *blazing machine*. The willow consists of a conical drum, the axis of which is placed horizontal or nearly so. The surface of the cone carries a series of projecting pegs or spikes, and the upper portion of the case which encloses the cone is furnished on its inner surface with a similar series of spikes, the spikes of the cone moving in the intervals between the spikes of the case. This machine is fed at the smaller end of the cone by means of an endless apron formed of thin spars of wood, each of about three-quarters of an inch broad and half an inch apart, fixed at the ends to two endless leather straps, which twine round rollers. The cotton being placed upon this creeping apron, is slowly introduced into the willow, where it is seized by the revolving spikes, and whirled round with increasing velocity due to the increasing surface of the cone, until, in a few seconds, it arrives at the large end, where it falls upon a moving apron, which carries it away or turns it out upon the floor. As the cotton is being teased out by the spikes of the cone, the heavier impurities, such as twigs, sand, stones, &c., fall out through the open lattice or grid-work which forms the bottom of the machine. The lighter impurities, such as dust, &c., are driven by centrifugal force to the large end of the cone, where they pass out through a spiral cage sieve into square pipes which convey them away.

The next process is intended to remove the remaining sand, &c., and to form the cotton into laps to feed the breaker carding-engine. The cotton being spread upon a feeding apron, is introduced into the machine by means of feeding rollers; as soon as it gets within the machine it comes under the beating action of flat bars, which are moved round with great rapidity, and strike with their fans upon the cotton fibres as they slowly escape from between the feeding rollers. It is then conveyed out of the machine and turned out upon the floor. It is then passed to another scutching machine, in which, after being batted, it is formed into a cylindrical roll or *lap*, ready for the carding engine.

Next comes the process of "carding," performed by two machines, a "breaker" and a "finisher" card. The lap roll, prepared by the lapping machine, is mounted at one end of the carding-engine; the lap is gradually unwound, and passes along the surface of a feed-board, between a pair of feed rollers, until it comes in contact with the first roller-card, or *licker-in*, which draws in the cotton in single filaments. As this card, No. 1, rotates, its teeth come in contact with the teeth of the large drum, which strip off the filaments; but the rotation of the drum almost immediately brings it in contact with the squirrel, a roller clothed with a wire brush, No. 2, which strips off the filaments from the drum, and, by its revolution, transfers them again to No. 1, which again delivers

them to the drum, together with fresh filaments taken up from the feeding-rollers: the filaments which escape the action of No. 1 and 2 are seized by No. 4, which is placed much nearer to the drum; the cotton thus taken up by No. 4 is teased out by No. 3, which is nearly in contact with it but moving with greater speed. From No. 3 it is again transferred to the drum, to be carded out again by No. 4, and any filaments which still remain are arrested by the first flat top-cards, and held until they are disentangled by the revolution of the drum. In this way the filaments become gradually arranged on the surface of the drum in nearly parallel lines, which is the condition sought for, and in this state they are not teased off by the urchins, but pass round to the opposite end of the machine, and are removed from the drum by a smaller drum card called a *doffer* or *stripper*, on the surface of which the cards are arranged in spiral lines. The fine fleece of the transparent web is removed from the doffer by means of a doffing knife, the lower edge of which is toothed like a fine comb, and this, by the action of a crank, is made to strike down with a rapid motion, over the points of the cards. The fine transparent fleece thus shaved off is equal in breadth to the length of the card on the doffer, and is wound upon a large wooden roller, which, when filled, is removed and used for feeding the finisher card. As the fleece is removed from the finisher card it is contracted into a narrow riband, by being passed through a funnel, and its fibres are ingeniously drawn out and straightened, and then spread out into a flat riband, called a *card-end* or *sliver*, which is finally received into a tall tin can.

The next operation is that of "drawing," and is intended to carry out in a still more perfect manner the operation which was commenced at the close of the carding, namely, *drawing* out and elongating the slivers, straightening the filaments, and laying them as parallel to each other as possible. This is effected by a drawing-machine, which is used for doubling and drawing the web or sliver prepared by the finishing carding-engine, and delivering and coiling it into cans for the next operation. This machine is furnished with a series of self-acting guides, which stop the machine as soon as the sliver breaks, in passing from the can to the roller. It is also fitted up with the coilers and revolving motions to the cans.

Next is the slubbing-machine, of 28 spindles, which is used for drawing the slivers prepared by the last machine, and afterwards thrusting and winding them on bobbins. After this is the second slubbing or intermediate machine, 54 spindles, used for doubling and drawing the slubbings, and twisting and winding them on bobbins for the creels of the roving machines. This machine is introduced in order gradually to reduce the sliver, so as to obtain a more even and a fuller thread.

The next is the roving-machine, used for the same purpose as the last, and twisting and winding the slubbings on still smaller bobbins for the creels of spinning-machines. In these machines there is a self-acting motion for stopping the machine when the sliver breaks.

The rovings thus prepared are finished at one of two machines, the throstle or the mule jenny.

The bobbins filled with rovings from the bobbin and fly-frame occupy the upper part of the throstle frame. Each roving is passed through three pairs of drawing rollers, which draw it out to the proper degree of fineness;

on quitting the front pair, the roving is guided by a small ring or a notch of glass let into the frame, towards the spindles, which revolve with great rapidity, and produce, by the motion of their flyers, a low musical hum, which is said to have given the name to this machine. By the rapid motion of the spindle, the roving is twisted into yarn, which passing through an eyelet at the end of one of the prongs of the flyer, proceeds to the bobbin, which is threaded upon the spindle, and is wound upon it. The bobbin fits loosely on the spindle, its lower end resting upon a shelf, called a copying-rail, which has a slow up-and-down motion, and thus distributes the yarn equally upon the bobbin.

From the roving-machine the yarn passes to the self-acting mules. The long and complicated machines, which advance and recede with a curious motion. In these machines the yarn is spun, at the same time slightly extended or drawn out. The yarn is now ready for weaving, and is wound on bobbins by a winding-machine. It is prepared for weaving by the warping-machine, which draws out from a number of bobbins the threads forming the warp of the future cloth, and lays them parallel to each other. In order to give stiffness to the fabric, these threads then frequently receive a density of paste; this is also effected by an ingenious machine.

The long threads of the cloth are thus prepared for weaving. The thread which goes across (weft) are combined within the shuttle of the loom. The best process in plain weaving is the proper arrangement of the warp threads in the loom. When this is effected, and the shuttle charged with its small "cop" of yarn, the machine is put in motion, the shuttle flies by mechanical power from side to side, while the warp threads alternately rise and fall, enclosing the yarn left by the shuttle in its passage, and the machine, in a short time, produces the manufactured calico. Such is the outline of the processes concerned in the passage of cotton fibre from its first to its last state: and in this part of the Exhibition the most interesting and important of these processes are fully represented.

Numerous other machines besides those devoted to cotton are found in this room, including a rotary pump, and several beautiful specimens of steam-engines, which are driven by high pressure steam conveyed in clothed tubes under the floor from the boiler-house at the north-west corner of the Building.

In addition to the machines enumerated, attention should be directed to several new forms of steam-engines, which appear to present a singular contrast to the ponderous engines originally projected by Boulton and Watt. A rotary engine near the door leading to the Refreshment Court, is extremely curious, and is furnished with a remarkable form of steam-governor in the shape of a revolving metal disc. There is also a set of machinery for cutting stone. Perhaps the most beautiful machine in this department is the small one included within the space of Messrs. Hibbert and Platt, and placed near the corner. This small, but wonderful engine, is intended for making the iron-wire brushes—technically, "cards"—which are employed in the cotton-carding engines. The operations it performs are the following:—It cuts the wire of a proper length; it then takes it between metallic fingers and bends it in the middle; the two holes for its reception are then pierced in the ribbon, the bent portion

of wire is thrust into them, and secured. All these operations are performed in regular succession, and with the most undeviating exactness and regularity. "Cards" used formerly to be made by hand, and the manipulation required was such that it appeared hopeless to devise a machine capable of performing the whole series. It is said that the original machine was the invention of a Mr. Ellis. In addition to this is an ingenious machine for making beer-barrels, by which a 56-gallon cask can be made in five minutes. There are also some American machines of interest. The Western Refreshment Court can be entered from this room.

Machinery in Motion, going East.

On entering the next apartment, which is of great length, and is filled with machinery from the one end to the other, from the preceding, some pleasing models of power-looms, warping and edging machines, are exhibited in motion. Near the inner wall is an old loom made in 1801, placed in juxtaposition with a power-loom made in 1850. The contrast is very remarkable, both in size, mechanism, and in the power of production, and character of the product. Perhaps, however, it is in strongest contrast with the splendid Jacquard power-loom for weaving worsted damask, immediately behind it. This ponderous machine, with its thousands of perforated cards, by which the damask pattern is produced in weaving, stands a monument of mechanical skill and forms a perplexing study to those who regard a Jacquard loom for the first time. The innumerable beads, the harness of the weaver, crossing each other, and ultimately lifted by the operation of the cards in question, give the whole machine an appearance of the most abstruse and confusing character, although in reality its principle is extremely simple, and the apparent complication is only due to the excessive multiplication of simple individual parts. A silk-loom model is also seen in operation. These machines are put in motion by a small pendulous oscillating steam-engine, which drives the necessary shafting, supported on upright bearings. A patent self-acting mule is seen in operation near this spot. Beyond these are other machines of an interesting kind. One of these is an ingenious machine for making cotton-reels. The small pieces of cylindrical wood are dropped in at a particular part of the apparatus, and are discharged from it, having the usual form of a reel. A large number of reels can be turned out by this machine in a very short space of time. Another extraordinary engine is employed in wool-combing, as a substitute for hand labour: this machine is of circular form, and performs a series of operations of the most remarkable kind, drawing out the long staple of the wool, separating it from "burrs" and "motes," and discharging the short staple wool at one part, while the fine long wool is taken off at another, and rolled upon a cylinder, all these operations being fulfilled by automatic mechanism. Machinery for the manufacture of worsted yarn is also found here.

A patent steam-engine, constructed upon the expansive principle, moves some of the smaller things. The object of this invention is the application of high-pressure steam, working expansively, to engines which have been constructed originally of sufficient strength only for low-pressure steam. Attached to this engine is a self-registering indicator, by which the pressure in the cylinder

is ascertained, and the actual dynamic force exercised by the steam upon the piston is marked by a pencil on a sheet of paper. Another oscillating cylinder steam-engine of curious form is seen a little beyond. Patent sun-roofs, for houses, and specimens of the reeds in "dents" used for looms, to separate the threads of the warp, are contained in a case. These "reeds" are made of thin steel ribbon, by a machine (not exhibited) of extreme ingenuity, which cuts all of a due length, registers the number cut, and delivers them into a box. Beyond is an apparatus called a "Jacquard loom reader," with keys like a piano. It is intended to assist in the interpretation of those mysterious cards, with holes in them, by means of which the Jacquard loom has been made to accomplish the most surprising results.

A little beyond are practical illustrations of the process of electro-plating. Various plated articles are seen, and the method of depositing silver or copper upon their surface is shown. The operation is extremely simple, and its applications have developed themselves in a degree highly remarkable of late years.

Upon the wall of this avenue are suspended specimens of plaid woollen scarfs and shawls, great coats, sail-cloths, sea-line yarns, sheetings, and duck.

Proceeding eastward, a complete set of flax machinery is encountered. The greater part of this is patented, and exhibits improvements in the various processes connected with the preparation of this important material for textile purposes. The operation of scutching commences this series of processes.

The object of the next operation, *scutching*, is to separate the broken woody portion of the flax. This is done in the patent flax machinery by substituting whalebone brushes for the beating arms; these arms are said to penetrate the straw, and to divide the fibre without tearing it.

The flax is next divided into lengths. In making these lengths, the ends are required to be rough or jagged; the flax is held at both ends, and passed between two pairs of wheels, situated one pair on each side of a wheel furnished with oval teeth; the two pair of wheels hold the flax firmly while the centre wheel, moving with great velocity, divides or tears the flax asunder.

The flax is next *heckled*. By the process of *heckling*, the filaments of flax are cleaned, split, separated into their finest fibres, and arranged in parallel order. The short fibres which are unfit for spinning, together with dust or dirt, are also removed.

In the heckling machine, a portion of the flax is spread out and held fast in an improved holder made of gutta percha. A number of these are then conveyed to a sort of revolving drum, and hooked on at distances of a few inches from each other, their unsupported ends falling on an internal drum covered with sharp heckling teeth, and revolving with considerable velocity, and in a contrary direction to the external one, the motion of which is slow. When one machine has performed its work, the holder is thrown off upon a rail, from which the machine-minder removes it to the second heckling machine, where the other side of the strick is heckled; from the second it is removed to a third, where the points are finer, and so on until the line is sufficiently fine. In the patent flax machinery under consideration, the flax is passed through a brushing machine previous to heckling, the effect of which is to remove the dirt, and to lay the fibres parallel for the

heckling machine, by which means a much less quantity of tow is produced than under ordinary circumstances. In one of the heckling machines both sides of the flax are heckled at the same time.

The tow produced in the above operation being similar to cotton in its fibre, cotton machinery, in a modified form, has been applied to the spinning of tow.

The spinning of flax does not greatly differ from the throstle-spinning of cotton; but as the fibres of flax have not the same tendency to combine together as in cotton, it is necessary to moisten them with water to make them adhere to each other during the process of spinning, and also to render them more pliable and easy to twist. The water used is warmed to 120° Fahr. The water is contained in a trough which runs the whole length of the spinning frame.

Yarn is made into linen thread by doubling; it is then bleached and formed into balls or wound upon reels into hanks.

In the vicinity of the flax machinery is a power-loom, for weaving the heavy sailcloth used in the navy.

Proceeding still toward the east, a remarkable machine for the manufacture of rope is exhibited. By this apparatus the necessity for long rope-walks is entirely obviated, and a powerful rope can be manufactured within the space of a few square feet of area. The machine in operation presents a remarkable spectacle, and it appears inevitable but that its bobbins should strike against each other in their gyrations.

The elegant silk machinery from Derby will next attract attention. It consists of a winding and clearing engine, of a spinning or twisting mill, of a doubling frame, a reeling machine, and drumming apparatus. These machines are in operation, and are under the charge of the tenders, generally girls who repair with surprising celerity a broken filament, stopping the bobbin on which it is being wound, until the repair is completed. In the vicinity of these machines is a patent power-loom for making fringes and similar fabrics, without the employment of shuttles.

The circular knitting-frame for weaving looped fabrics, elastic cloth, &c. is a remarkable machine, of highly complicated appearance, and presenting a singular aspect, with its appendage, of a large circularly woven fabric immediately beneath it. A circular machine for weaving hosiery is also exhibited near it.

The lace machinery of Nottingham succeeds to these. Patent elastic velvet, silk elastic taffeta, Simla shawls, &c., from the warp-lace machine, are exhibited, together with lace shawls, &c., from bobbin-net machine. The warp-lace machine is in operation with its countless repetition of parts, making plain blonde.

There is also in motion a beautiful machine for making bobbin-net lace, and specimens of figured and plain net, made by the machine.

Black silk lace-edgings, &c.; white silk blondes; edges; insertions, &c., made and ornamented by machinery.

The loose fibre of laces and muslins requires to be removed before it is fit for sale: this was formerly accomplished by causing it to pass rapidly over a red-hot cylinder, but minute jets of gas are now employed for this purpose. The machine in which it is effected is called a patent gassing machine, for singeing the loose fibre from lace, muslins, &c., giving them a more thread-like appearance, without injuring the fabric.

Interest will be excited also by inspection of the original model of Fourdrinier's paper-machine, with a specimen of pottery tissue paper, $2\frac{1}{2}$ miles long, made from old coal-pit ropes and hawsers. Mr. Fourdrinier's machine was the first paper-making machine which produced paper on the continuous principle. By far the greater part of the paper now made is manufactured by machinery, on this principle. The specimen of tissue-paper of the immense length mentioned, being a continuous sheet, is a beautiful example of the triumphs of this apparatus.

The apyrotpe, a machine a little beyond the last, is a self-acting machine for the manufacture of printing type from copper, zinc, or other metal, without heat, by means of dies and powerful pressure; its object is to produce a letter of more exact form than usual; and it is stated that the metal, hardened by the compression to which it is subjected in the process of manufacture, attains a durability estimated at sixty times that of ordinary cast type.

Rope-mats, waterproof roofing-cloth, and specimens of lace and net made by the Nottingham machinery, are upon the wall of this avenue.

Within an enclosed space, and driven by a small steam-engine at one corner of it, is the new Vertical Printing Machine, invented by Mr. Applegath, forming one of the most remarkable objects in this part of the building.

The chief advantage of this new arrangement is, that the whole motion or circuit of the type can be made available for printing, whereas, in the flat machine, more than half the motion of the reciprocating table is lost: and the reason for placing the cylinder in a vertical position is to obtain more easy access to the type, inking rollers, and other parts of the machine, and to permit more impressing cylinders to be arranged around the type-drum than can be done when it is fixed horizontally.

The circumference of the central drum, or path of the type, is exactly 200 inches;—in the machines at the "Times Office" eight impressing cylinders surround the type, which therefore prints eight sheets at every revolution: but in those machines the type is not truly cylindrical but *segmental*, which involves the necessity of using large cylinders; but when the type is purely cylindrical, smaller impression-rollers may be used, and the produce very much increased.

The machine which is erected in the Exhibition is made to print circular wood-cuts and type in the best manner; each of the four impressing cylinders has 50 inches space for itself and its attendant inking-rollers, and the form has the advantage of receiving its ink or colour from several rollers, each of which is *well distributed*, or evenly covered with ink.

The vertical position of the inking-rollers also conduces greatly to the production of good work, for the type or engraving is only touched on its extreme surface, while on the flat principle, where the inking-rollers act by *gravity*, the sides of the type are liable to receive colour: also any dust in the paper is shaken by the act of stopping, and falls upon the floor in place of being deposited upon the inking-rollers and distributing-table as in the flat machine; this is, in practice, a real advantage, for 50,000 impressions have been taken without once stopping to *brush out* the form or table. Another technical advantage in the printing of wood engravings, where delicate *overlays* are required, is that the impression-cylinders are in direct connexion with the type-drum, so that no irregularity of

motion can occur, and the *overlays* can be placed precisely where required without any fear of derangement.

The action of the machine is very simple: "the *layer-on*" draws a sheet of paper towards a small roller in rapid motion, which descends and causes the paper to enter between the vertical tapes which carry it downwards, when, having arrived at the proper position, it is suddenly stopped by narrow upright strips of wood, which advance and slightly compress the sheet between them, the vertical tapes at the same moment releasing it: the stoppers are then in their turn withdrawn, leaving the sheet of paper momentarily suspended by two small pulleys, mounted on delicate springs called finger-rollers. The sets of vertical rollers seen in rapid motion on each side of the sheet now advance against it, and impel it sideways towards the impressing cylinder, where it receives the impression from the type; the sheet continues its side motion, supported only by a single pair of tapes, which at the proper place are stopped, leaving the printed sheet suspended until the "taker-off" draws it down upon the taking-off table.

Next to it is the ingenious and well-known printing machine of Professor Cowper, one of the most important printing machines of the time when it was first introduced, and now universally employed. In the same space is a very remarkable envelope-folding machine, which introduces a jet of air as a new application in mechanical science, the air being caused to blow down the sides of the envelope preparatory to their being folded by the second descent of the folder.

A patent fuel economizer, models of steam-engines, French chocolate machinery, and articles belonging to naval construction, such as marine glue, cordage, masts and blocks, sails, &c., are found occupying the end of the space devoted to machinery in motion.

The central part of this space is occupied by an immense variety of manufacturing and other machines, lathes, planing machines, punching and shearing engines, lathes for amateurs, powerful self-acting slide-lathes for turning the parts of steam-engines, boring machines for turning out the cylinders of locomotives; all driven by small steam-engines placed in different parts. Each of these machines deserves attentive study, but their number is so great as to render a casual notice of them all that is really possible.

The size of the apparatus, and the noise made by the centrifugal pump, generally renders it attractive. An oscillating cylinder engine drives round at a great velocity the apparatus constituting this pump, and the water is raised by it in a vast volume, so as to resemble a mill-shoot, to the height of the girders of the building. Another centrifugal pump, of low lift, is placed near it. This pump is used for draining land, being capable of discharging 20 tons of water per minute, and draining, per hour, one acre of land covered with one foot depth of water. This apparatus is combined with a steam-engine, the disc and shaft of the pump serving the purposes of fly-wheel and shaft to the engine. The customary intermediate gearing, piston, slider, stuffing-box, or rubbing surface of any kind in the pump is not required.

Near these is a beautiful working model, in mahogany, of the water-wheels and pumping machinery of the great Devonshire copper-mines.

An interesting little machine, called into existence, like many others, by the cotton manufacture, is a patent forge

for making spindles for cotton spinning. The machine is shown in operation, and is employed to forge, draw down, and swage by steam power small articles up to two inches, round or square, such as rollers and spindles for cotton and other machinery, bolts, studs, shaft-ends, &c., without the use of hammer or anvil.

Fires not being allowed in the Building, rods of lead are used for illustrating the working of the machine. It is driven by a small donkey-engine.

Before leaving this part, the remarkable tubular wrought-iron crane from Manchester, and the working model of a brewery, deserve notice.

Galleries. British. South Galleries, going West.

Only a very general idea of the contents of the Galleries on this side of the building can be given; and this is the less to be regretted as those articles are generally such as are familiar to the eye, and require, therefore, little explanation.

The Galleries near the Transept are principally occupied by cases containing silks and shawls, many of which exhibit much taste in design and elaborateness of execution. On the foreign side of the Transept, the articles comprised within Class 20, for clothing, &c., are found in every variety, and beyond them specimens of the art of artificial-flower making, with other fancy goods. The works of the Electric Clock may now be inspected; the upright brass rod conveys the motion to the large hands of the dial outside the building.

CHEMICAL PRODUCTS, CLASS 2.

These are found in the South Gallery, proceeding westward. They comprise many articles interesting to the chemist and pharmacist, and some attractive by the beauty of their external aspect. Some of the crystals, such as alum, citric acid, copperas, and particularly sulphur and saltpetre, as seen in the case containing the materials for gunpowder, are extremely beautiful.

SUBSTANCES USED AS FOOD, CLASS 3.

A great variety of articles are included in this class, which are found to the west of the preceding in the same gallery. Tobacco, cigars, tea, coffee, chocolate, preserved fruits, agricultural produce, preserved meats, and many similar articles of home and foreign production.

A large collection of the vegetable productions of Scotland must also attract the notice of the naturalist, the horticulturist, and others, in this gallery.

VEGETABLE AND ANIMAL SUBSTANCES FOR MANUFACTURES, CLASS 4.

This class occupies spaces westward of the former, and contains various objects, such as specimens of ornamental woods, oils, grease, silk, gum in England, vegetable fibres, resins, varnishes, wools, hair, glue, &c.

NAVAL ARCHITECTURE, GUNS, &c., CLASS 8.

At the end of the South Gallery are various articles included in this class, such as guns, muskets, pistols, and swords, one of which is splendidly inlaid, succeeded by

naval models, exhibiting sections of ships, new modes of construction, propulsion, &c. These are contained in the space at right angles with the western end of the South Gallery.

Central South Gallery.

In the direction from east to west, that is, from the Transept forwards, this gallery will be found to contain in order the productions of the British silk loom, followed by

TAPESTRY, CARPETS, LACE, &c., CLASS 19.

Some of which are of great beauty and value. Lace produced by the wonderful machinery of Nottingham, is tastefully arranged in this gallery. In addition to the machine-laces are many others of beautiful texture and design. Pillow-lace, Geipure, Honiton, &c. Tapestry also in every form is exhibited in this gallery, and magnificent carpets are seen suspended from the girders. Specimens of tapestry and Berlin-wool work are also placed on the wall of the South Gallery.

WORKS IN PRECIOUS METALS, &c., CLASS 23.

These objects, which are of the most costly and valuable description, are found immediately following the preceding, in the same gallery. They comprise the most artistic productions of the craft of the silversmith, and present an imposing appearance of the wealth which can create the demand for such articles, and the skill which is able to produce them.

North Galleries, going East.

PHILOSOPHICAL, MUSICAL, HOROLOGICAL, AND SURGICAL INSTRUMENTS, CLASS 10.

This important Class commences at the western end of the Central South Gallery, beginning with watches and clocks. The Exeter Clock, occupying 34 years in its manufacture, deserves notice. The Class includes the Great Organ with 80 stops, the globes, the photographic, and other instruments, electrical telegraphs; and beyond these, pianos, organs, harps, and other musical instruments.

GLASS, CLASS 24.

This Class comprises many beautiful specimens of glass, in various stages of manufacture, and magnificent chandeliers, including one exhibited by Her Majesty, is contained in the Central North Gallery, toward the end.

POTTERY, CLASS 25.

The end near the Transept of this Gallery, and the Galleries near the North Entrance of the Transept, contain the specimens of the ceramic art included in this Class. Among them are pleasing groups in Parian, and an interesting model of a tomb, with vessels imitating the antique.

Suspended from the girders of this Gallery are carpets, tapestry, &c., at the Transept end of it is the beautiful carpet exhibited by Her Majesty.

Over the north entrance to the Transept is a large organ of great power, and fulness of tone.

MISCELLANEOUS MANUFACTURES, CLASS 29.

The Galleries on the east of the Transept are appropriated to the articles in this Class, they are of the most miscellaneous description, and include dolls, toys, wax-work, and fancy-ware of all kinds, with fountains of scent.

North Gallery.

This gallery contains the following Classes, taken in their order from West to East.—*Class 7. Civil engineering, architectural, and building contrivances*; including a number of very beautiful models. *Class 21. Cutlery, edge and hand tools.* *Class 28. Manufactures from animal and vegetable substances*, such as caoutchouc, gutta percha, &c. These are found at the extreme western termination of this Gallery.

Outside the Building.

SOUTH SIDE.

Block of serpentine, from the Lizard, Cornwall, partly polished.

Two figures in artificial stone.

A figure of Lazarus, in artificial stone, cast from an original carved wood figure, said to be brought from Rome.

Blocks of gypsum used in the manufacture of plaster.

Illustrations of Portland cement.

Blue flagstone, obtained from Horton Wood quarries, which have been worked probably about 100 years.

Blue lias limestone. Models in lias, Portland, and improved Roman cement, &c.

Slate slab, as raised from the quarries at Delabole. Slate cistern.

Specimens of slate.

Illustrations of the strength of cement.

Mercury, after Giov. da Bologna, in artificial stone.

A cistern or bath of Forss-Rockhill flag. Samples of the stone, showing the natural surface, the half-rubbed and the full-rubbed surface, &c.

An obelisk in granite. Sundry large slabs and blocks of stone.

Slate filter, the water being filtered in its ascent.

Specimens of Irish flagging.

Rockhill paving-stone, from the original quarries.

Waterproof artificial stone, for sewers and drains of large dimensions; for flooring churches. Drains for railways, &c.

Flagstones and freestones, known as Arbroath pavement, from Leysmill Quarries, dressed by Hunter's stone-planing machine.

Grindstones from the Ardsley Oaks Quarry, Barnsley.

Freestone block, from Nitshill Quarry. Grindstone from the same quarry, three feet in diameter by six inches thick.

Grindstones from the Oaks Quarry, near Barnsley, 8 feet in diameter and 14 inches thick, for grinding machinery, &c.

Block of rough serpentine.

Blue lias, hydraulic cement, and polished stones, from Kirton Lindseys Tunnel Stone Works.

Specimens of pure limestone, from Pentregwyddel Quarries, near Abergele, Denbighshire, used as a lithographic stone, &c. Specimens of stone from Graig-lwyd Quarries (Penmaen-Mawr, Carnarvonshire).

Block of stone, partly polished. Block of marble and paving-stones.

Flags and steps. Block: four tons.

Steam-coal from Coed Talon and Leeswood collieries, near Mold, North Wales; a single block weighing 16 tons.

Anthracite coal, from Tenby, South Wales. Specimens of patented artificial stone.

Specimens of South Staffordshire coal, 18 feet in circumference, and five tons in weight. Specimens of iron ore.

A large block of anthracite, or stone coal, from Cwmllynfell, in the Swansea valley.

Blocks of Arley and Pemberton coal.

Steam-coal, from Loughor, South Wales.

Large specimen of the Staffordshire thick, or ten-yard coal; weight 13 tons. Raised from a depth of 165 yards by the ordinary steam-engine, with no other apparatus than that generally in use.

Coal, from the mines of Staveley, county of Derby, raised from a shaft 459 feet deep. The block is estimated to weigh 24 tons.

Anthracite coal, from Llanelly, South Wales.

The Blaengwawr steam-coal, from Aberdare.

Brynddwy coal, from between the vales of Neath and Swansea. Anthracite coal, from the western side of the vale of Neath.

Steam-coal, the produce of a newly opened colliery. The coal may be brought up in masses of 50 tons weight.

Block of coal, from Brymbo, near Wrexham, North Wales.

Pillar, exhibiting a complete section of the Barnsley thick bed of coal, from the Elscot colliery.

Block of steam-coal.

Block of coal.

Fossil tree from the coal measures.

Column of South Staffordshire thick coal—showing the different working seams as they exist in vertical section.

NORTH SIDE.

Granite column and pedestal, 30 feet high, from the Cheesewring granite quarries, near Liskeard, Cornwall.

Large anchors.

Two life-boats.

Railway gates.

Two greenhouses on a new construction.

New mode of glazing greenhouses.

Flower pots, &c., of superior clay. Flower guards and seed basins, strawberry tiles, striking pans, &c.

Large pipes in stone ware, and other articles.

A still, and other articles in stone ware.

Pipes, and other large stone ware.

Sundry objects in stone ware.

Fire-clay goods.

Our survey of this Great Building and its contents is now completed, only an outline of the Exhibition can be thus afforded. And for purposes of particular instruction it must be visited again and again. No one can leave this Industrial Palace without emotions of wonder and gratification, excited not less by its contents than by the beauty of the structure which encloses them. Neither should its precincts be quitted without a sense of gratitude to that Divine Being from whom alone proceeds every good and perfect gift for the instruction and amelioration of mankind.—R. E.

ALPHABETICAL LIST OF PLACES EXHIBITING. UNITED KINGDOM AND COLONIAL POSSESSIONS.

United Kingdom.**METROPOLIS :—**

London.
Westminster.
Brentford.
Chelsea.
Chiswick.
Finsbury.
Greenwich.
Hammersmith.
Hampstead.
Kensington.
Marylebone.
Poplar.
South London.
Southwark.
Tower Hamlets.
Woolwich.

Aberdeen.
Abingdon.
Alloa.
Arbroath.
Ashburton.
Ashford.
Ashton-under-Lyne.
Aylesbury.

Bakewell.
Banbury.
Barnard Castle.
Barnsley.
Barnstaple.
Basingstoke.
Bath.
Batley (Yorkshire).
Bedford.
Belfast.
Berwick-upon-Tweed.
Beverley.
Bideford.
Bingley (Yorkshire).
Birmingham.
Bishops Stortford.
Blackburn.
Bolton (Lancashire).
Boston.
Bradford (Yorkshire).
Bradford (Wilts).
Brentwood.
Bridgewater.
Bridport.
Brighton.
Bristol.
Bromsgrove.
Buckingham.
Burnley.
Burton-on-Trent.
Bury St. Edmunds.
Bury (Lancashire).
Buxton.

Camborne.
Cambridge Town.

Canterbury.
Cardiff.
Carlisle.
Carnarvon.
Cheadle.
Cheltenham.
Chelmsford.
Cheshunt.
Chester.
Chester.
Chichester.
Chippenham.
Cockermouth.
Coggleshall.
Colchester.
Colne.
Cork.
Coventry.
Crewkerne.
Cricklade.
Cowes.

Dalkeith.
Darlington.
Deal.
Derby.
Devizes.
Devonport.
Doncaster.
Dorchester.
Dover.
Driffield, County of.
Dumfries, Burgh.
Dunbar.
Dundee.
Dunfermline.
Dunmow.
Dunstable.
Durham.

Edinburgh.
Elgin.
Exeter.
Exmouth.
Falkirk.
Falmouth and Penryn.
Farringdon.
Farnham.
Folkestone.
Frome.

Galashiels.
Glasgow.
Glastonbury.
Glossop.
Gloucester.
Godalming.
Gosport.
Grantham.
Gravesend.
Greenock.

Guildford.
Guernsey.

Halifax.
Hartlepool.
Harwich.
Hastings.
Hawick.
Helston.
Hemel Hempstead.
Hereford.
Hertford.
Honiton.
Huddersfield.
Hull.
Huntingdon.

Ipswich.
Isle of Man (Douglas).
Isle of Wight.
" Ryde.
" Cowes.
Jedburgh.
Jersey.

Keighley (Yorkshire).
Kendall.
Keswick.
Kidderminster.
Kilmarnock.
Kirkcaldy.
Knaresborough.

Lancaster.
Launceston.
Leamington.
Leek.
Leeds.
Leicester.
Lewes.
Lichfield.
Limerick.
Lincoln.
Liskeard.
Liverpool.
Llanelly.
Louth (Lincoln).
Luton.

Macclesfield.
Maidenhead.
Maidstone.
Manchester.
Margate.
Marlborough.
Marlow, Great.
Matlock.
Melksham.
Montrose.
Newark.

Newbury.
Newcastle (Staffords).
Newcastle-on-Tyne.

Newnham (Glo'ster).
Newport (Monmouth).
Newport Pagnell.
North Allerton.
Northampton.
Norwich.
Nottingham.

Oswestry.
Oxford.

Paisley.
Penzance.
Peterborough.
Perth.
Plymouth.
Poole.
Portsmouth.
Preston.

Ramsgate.
Reading.
Redruth.
Reigate.
Retford, East.
Richmond (Yorkshire).
Ripon.
Romsey (Hants).
Rotherham.
Rugby.
Runcorn.
Rye.

Saffron Walden.
Salisbury.
Scarborough.
Selby.
Selkirk.
Settle.
Sheerness.
Sheffield.
Shrewsbury.
Southampton.
South Shields.
Spalding.
Stafford.
Staffordshire Potteries.
Stamford.
St. Albans.
St. Austell.
St. Neots.
Stirling.
Stockport.
Stockton.
Stonehouse (Plymth.).
Stourbridge.
Stroud.
Swansea.

Tamworth.
Taunton.
Tavistock.
Totness.
Truro.
Tunbridge Wells.

Wakefield.
Walsall.
Waltham Abbey.
Wareham.
Warrington.
Warwick.
Waterford.
Wellington (Somerset).
Wells.
Wexford.
Whitby.
Whitehaven.
Wigan.
Winchester.
Windsor.
Wirksworth.
Wisbeach.
Witham.
Wolverhampton.
Wolverton.
Wootton-under-Edge.
Worcester.
Workington.
Yarmouth, Great.
Yeovil.
York.

Colonies.

East Indies, Indian
Archipelago, &c.
Jersey and Guernsey.
Ceylon.
Ionian Islands.
Malta.
Cape of Good Hope
and Natal.
West Coast of Africa.
Canada.
Nova Scotia.
Newfoundland.
New Brunswick.
St. Helena.
Mauritius, Seychelles,
&c.
St. Domingo.
Grenada.
Montserrat.
Jamaica.
St. Kitt's.
Barbadoes.
Antigua.
British Guiana.
Bahamas.
Trinidad.
Falkland Islands.
Bermudas.
South Australia.
Western Australia.
New Zealand.
New South Wales.
Van Diemen's Land.
Labuan, Borneo, &c.
Gold Coast and Ash-
antee.

FOREIGN STATES.

America, United States of.	b. Grand Duchy of Baden ; Southern parts of the West Provinces of Prussia and Electoral Hesse.	2. Bavaria.	Netherlands.
Austria.	c. Provinces of Prussia and Lithuania.	3. Saxony.	New Granada.
Belgium.	d. Northern Parts of Elec- toral Hesse, and of the Prussian West Pro- vinces; Principality of Lippe.	4. Wurtemberg.	Oldenburg.
Brazil.	e. Grand Duchy of Saxony, Prussian Saxony.	5. Frankfort-on-the-Maine	Persia.
Chili.	Brunswick, Anhalt, and States of Thuringia.	6. Hesse-Darmstadt, Grand Duchy of	Peru.
China.		7. Luxemburg.	Portugal and Madeira.
Denmark.		8. Nassau.	Rome.
Egypt.		Greece.	Russia.
France and Algiers.		Hamburgh.	Sardinia.
Germany.— <i>Zollverein States</i>		Hanover.	Society Islands.
1. Prussia, Baden, and United States of North- ern Germany.		Lubeck.	Spain.
a. Provinces of Branden- burg, Silesia, Posen, and Pomerania.		Mecklenburg-Strelitz.	Sweden and Norway.
		Mecklenburg-Schwerin.	Switzerland.
		Mexico.	Tunis.
			Tuscany.

SUGGESTIONS FOR THE GUIDANCE OF LARGE PARTIES VISITING THE EXHIBITION.

APPOINT some one to act as leader, and, if possible, one who has visited the Exhibition, and if a little higher in station or influence than the rest, the better.

OUTSIDE.—Meet at some place to be appointed in Hyde Park, and thence by the Serpentine to the Building, in order to get a good outside view.

Enter the Building at the East end, nearest to Hyde Park Corner, and leave by the same entrance. Make this the starting-point.

INSIDE.—*First Course.*—Pass up the centre, keeping on the left side and return back down the other side of the centre, viewing the Transept (where the large trees are), in passing, and also passing occasionally into interesting departments at the sides of the centre.

Second Course.—Go up into the Gallery on the left side, and pass along the front to the other end of the Building, and returning along the front of the opposite Gallery. Descend at the end to the starting-point again.

Third Course.—Start again to the left on the Ground-floor, keeping the inside passage: pass along that side to the end of the Building again, then cross over to the inner passage on the other side. Pass into the machinery department, and return on the inner side of the Building to the starting-point again.

Note.—These courses may be taken in different order, but the course cannot be reversed, as all persons, in case there is a crowd, will be required to pass in the direction stated,—that is, always with the sun, from left to right. No person will be permitted to turn back against the stream.

Let the party keep together as much as possible; but if missed, it may easily be found again by following its progress as above.

If departments be visited, always return out of the departments by the same way they are entered, and pass along always from left to right. Never pass direct from one department to another.

When found convenient as to time and place, take refreshment, and all together. The refreshment-places are at the two ends, and the centre of the Building (right side); but the centre one is for the gentry principally. Water is given away. No beer or spirits are allowed.

As to time.—The party should arrive at the Park not later than ten o'clock, enter the Building about half-past ten, complete the first course about one o'clock, the second course about three o'clock, and the third course about five o'clock, and leave about half-past five, or earlier or later according to the sense of fatigue, or the length of the journey home.

Objects that attract attention will be readily found, and may easily be ascertained by asking questions of the by-standers.

If the party be too large all to be known to each other, some token may be worn by each, a flower, a ribbon, a card in the hat-band, or such like.

Practise civility and forbearance, and accommodate others as much as possible, and bear in mind that any instructions that may be given by the police are for the good of all.

RULES FOR VISITORS TO THE EXHIBITION.

1. **TIMES OF OPENING AND CLOSING.**—The Exhibition will open at 10 A.M., except on Saturdays, when it will open at 12. It will close every evening at 7 P.M., at which hour bells will be rung in the building.—N.B. The Commissioners reserve to themselves the right of altering the hours as they may find requisite.

2. **PLACES OF ENTRANCE AND EXIT.**—Carriages must go to the *South and West Entrances*. They may drive up close to the outside of the iron railing.

Foot Visitors may enter at the *South, West, and East Entrances*, the latter being reserved for them.

There are several *pay offices* at each entrance. *Season Tickets* will pass through all the entrances.

There are several *exit doors* at the sides and ends of the building, so marked on the plan.

No persons will be allowed to go out by the entrance doors. or enter by the exit doors.

3.—PRICES OF ADMISSION :—

On May 1st *Season Tickets* only were admitted.

On May 2nd and 3rd the Price of Admission was for . . . each Person } *One Guinea.*

From May 5th " } *Five Shillings.*

On May 26th and after " } *One Shilling.*

Except on Fridays, when it is " } *Half-a-Crown.*

And on Saturdays " } *Five Shillings.*

N.B.—No change given at the *Pay Places*.

4. ORDER OF PROCEEDING THROUGH THE BUILDING.

—The building is divided into *Areas* (i.e., spaces of 24 feet square, between 4 columns), which are marked on the Plan by letters along the end, and by numbers along the side of the building: these letters and numbers are marked on every column in white letters at about 7 feet from the ground. The articles are divided into *Classes* and *Nations*, and the Names of *Classes* and *Nations* are given on the Plan, and marked upon the iron girders of the building. The Catalogue is classified on the same system. The numbering of articles is generally from West to East by *Classes*. Visitors are requested, in going through the building, to follow as much as possible the course of the sun, i.e., to go from the left towards the right in the passages and courts, in order to prevent confusion. Plans of the building are placed in different parts of it.

Visitors are particularly requested not to touch any of the articles.

5. **OFFICIAL CATALOGUES AND MAPS OF THE BUILDING** may be purchased of the Contractors, Messrs. Spicer and Clowes, at the different entrances.

1. The *Official Catalogue*, 1s., or in 3 Parts, 6d. each; interleaved for notes, with writing-paper, 1s. 6d. each Part.

2. The *Official Descriptive and Illustrated Catalogue*, super-royal 8vo. Part I. 10s.

The other Sections will be ready shortly.

3. *Synopsis of the Contents of the Great Exhibition*, or *Companion to the Official Catalogues*, 6d.

4. *The same in French*, 1s.

5. *Lithographic Plan of the Exhibition Building*, 6d.

6. *Letter-press Plan of ditto*, 1d.

7. *Popular Guide to the Great Exhibition*, 2d.

8. *Saxon Section of the Exhibition Official Catalogue*, separately, with a priced list, 3d.

French and German Catalogues will be published as soon as they can be arranged, 2s. 6d. each.

6. **REFRESHMENT AND WAITING ROOMS.**—Refreshments of a light description are provided according to an authorized scale of charges *hung up in the rooms*. The first-class room is in the Centre Transept; the other rooms are on the West and East sides.

Waiting-rooms and water-closets, &c., are provided adjoining the different refreshment-rooms, and charges of 1d. and ½d. are made for the use of them.

7. **STICKS AND UMBRELLAS, &c.**—The Commissioners have not absolutely prohibited Visitors from bringing sticks and umbrellas into the building, but they reserve the right of doing so if necessary. The public are requested to abstain from bringing them as much as possible, and on no account whatever to touch any article with them.

8. **NO DOGS ADMITTED.**

9. **LOST ARTICLES.**—Inquiries for articles lost or found should be made at the Police Office at the Prince's Gate, opposite the South entrance.

10. **ATTENDANTS OF THE EXECUTIVE COMMITTEE.**—No gratuities are to be given to any officer or servant of the Exhibition. Visitors are requested not to offer any, as the acceptance renders the receiver liable to dismissal.

11. **EXHIBITORS' ATTENDANTS.**—The stalls, &c., at which exhibitors have provided attendants, are indicated by a Card.

12. **SALE OF ARTICLES.**—No article is allowed to be sold in the Building, except the *Official Catalogues*, the *Medals* struck at the press, refreshments, and bouquets of flowers; and no other articles are allowed to be taken out without authority.

By order of the Executive Committee,
M. DIGBY WYATT, *Secretary*.

EXHIBITION OFFICIAL CATALOGUES,

SYNOPSIS, HANDBOOK, PLANS, PRICED LISTS, &c.,

PUBLISHED BY THE CONTRACTORS TO THE ROYAL COMMISSION.

1. THE EXHIBITION OFFICIAL CATALOGUE,
Corrected Edition, Fep. 4to., price 1s. 3d.

2. PORTABLE COVERS for ditto, price 1s.

3. THE EXHIBITION OFFICIAL CATALOGUE,
Fep. 4to., in Three Parts, price 6d. each.

4. ——— interleaved with Writing Paper for Notes, in
Three Parts, price 1s. 6d. each.

5. ——— in French, price 2s. 6d.

6. ——— in German, price 2s. 6d.

7. THE SYNOPSIS OF THE CONTENTS OF
THE GREAT EXHIBITION. By ROBERT HUNT, Keeper
of Mining Records. Intended as a Companion to the
Official Catalogues. *Fourth and Enlarged Edition*,
with a Classified Table of Contents. Price 6d.

8. SYNOPSIS, OU REVUE SOMMAIRE, DES PRO-
DUITS DE L'INDUSTRIE DE L'EXPOSITION UNIVERSELLE
DE 1851. Par ROBERT HUNT, Archiviste des Mines.
Price 6d. Traduit par F. HILAIRE D'ARCS.

Au moyen de ce livret, on peut régler, de la manière la plus avan-
tageuse, le temps que l'on peut consacrer à visiter l'Exposition, et en
voir toutes les merveilles en une seule ou plusieurs visites.

9. HUNT'S HANDBOOK TO THE OFFICIAL CATALOGUES.

The reiterated expression of the feeling that it is of the utmost
importance to furnish, for every inquiring visitor to the Great
Exhibition, information on those efforts of thought and industry
which are there displayed, and of the natural products upon which
human power has been exercised, has led to several suggestions
for rendering the whole popularly intelligible.

With this object in view the Contractors for the Official Cata-
logues obtained the aid of a number of Gentlemen conversant with
the several departments of the Exhibition, as annotators to the
Descriptive and Illustrated Catalogue; and in that work is thus
accumulated a large mass of the most valuable information, which
cannot but prove exceedingly useful, and which must form the most
complete permanent record of the great event it registers.

It is felt, however, that a more succinct interpretation of the
Exhibition is required, and the success which has attended the
publication of the "Synopsis" appears to indicate the direction in
which the attempt should be made.

A HANDBOOK, arranged in such a manner as to be an easy guide
to the position of each group in the Building, and at the same time
explanatory of the characteristics of the objects comprehended,
appears the best form of supplying the want rendered so strikingly
evident by the instructive character of the collection. Such a
publication is determined on, and the following plan has been
adopted, as promising to be most useful:—

In the United Kingdom the existing divisions will be adopted,
and every object which may appear to require more explanation
than could possibly be given in the Catalogue will be fully de-
scribed. The peculiarities of every remarkable natural production,
and the best obtainable information of its history; the processes
by which it is made available for use or ornament; a detailed
account of the modes of manufacture; and a description of the
machinery employed in each stage of conversion, will be given.
The Colonial produce, and the exemplifications of industry ex-
hibited by the Colonies, will form the subjects of separate con-
sideration. The Foreign Departments will be taken, as arranged,
in States, and each one subjected to careful examination, with
a view to the complete elucidation of the peculiarities of their
National Industry.

In carrying out this purpose, the assistance of gentlemen who
have distinguished themselves in science, or are conversant with
manufacture, will be obtained; and it is hoped that the arrange-

ment of the work will be such as will enable every visitor at once
to find the article described, and to obtain a correct account of its
characteristics.

The Handbook will be issued in Parts, each embracing several
classes, arranged upon a system which will render each part com-
plete in itself, without in any way interfering with the unity of the
entire work, which, it is hoped, may be found to give a correct
interpretation of all that is included within the Great Exhibition
of National Industry.

The Divisions of the Parts of the Handbook, determined, as far
as possible, according to the relation of the individual Classes, will
be the following:—

PART 1.—Mining and Metallurgy—Iron—Hardware—Glass—
Pottery and Mineral Manufacture, comprising Classes 1, 21, 22,
24, 25, 27.

PART 2.—Chemistry—Vegetable and Animal Kingdoms, and Manu-
factures (not woven) therefrom, comprising Classes 2, 3, 4, 9, 16, 28.

PART 3.—Machinery, Engineering, and Naval Architecture, compris-
ing Classes 5, 6, 7, 8.

PART 4.—Woven and Felted Manufactures, Dyeing, &c., comprising
Classes 11, 12, 13, 14, 15, 18, 19, 20.

PART 5.—Philosophical Instruments—Music—Clocks—Sculpture, &c.,
comprising Classes 10, 30.

PART 6.—Paper—Precious Metals—Furniture—Miscellaneous, com-
prising Classes 17, 23, 26, 29.

PART 7.—The Colonies.

PARTS 8, 9, 10.—The Foreign States.

10. COLOURED LITHOGRAPHIC PLAN OF THE
EXHIBITION BUILDING. Price 6d.

11. A POPULAR GUIDE TO THE GREAT EXHI-
BITION OF THE WORKS OF INDUSTRY OF ALL NATIONS,
1851. Containing a Plan of the Building, an Histo-
rical Sketch of its Progress and Construction, and an
Arranged System by which the Contents can be best
examined; with Suggestions for the Guidance of large
Parties visiting the Exhibition. Price 2d.; or the
Plan separately, 1d.

12. PENNY LETTERPRESS PLAN AND GUIDE.

13. BRITISH EXHIBITORS' PRICED LIST.—The
BRITISH SECTION of the EXHIBITION OFFICIAL CATA-
LOGUE, printed separately, with a General Priced List
of Articles Exhibited, price 1s.

The charge to Exhibitors for insertion of the Prices and Des-
criptions of their Productions in this List will be at the rate of
one shilling per line in column (average eight words per line).
Orders should be forwarded to the Contractors as soon as possible,
with a Description of the Article. The length of the Description
is left entirely to the option of the Exhibitor; but nothing will be
inserted under a charge of Five Shillings; and it is absolutely neces-
sary, to insure insertion, that a remittance should accompany the order.

Exhibitors are referred to the Saxon Section of the Official Cata-
logue, with a Priced List of Saxon Productions, already published,
price 3d., as to the style and classification proposed for the British
Priced List. Only those Exhibitors will appear in the Priced List
who intimate their desire to that effect to the Contractors.

Any Exhibitor desiring to have separate copies of the List of
his own productions can be supplied at a reasonable cost, by giving
early notice to the Contractors.

"If every article had its price affixed, many relations would
strike the eye of an experienced observer which might lead him
to further inquiries, and probably to the most interesting results.
But it is quite impossible for him to write to any considerable
portion of 15,000 expositors for their list of prices, or even to go
round and ask for it in the Building itself."—*Exposition of 1851*,
&c., by CHARLES BABRAGE.

[Continued overleaf.]